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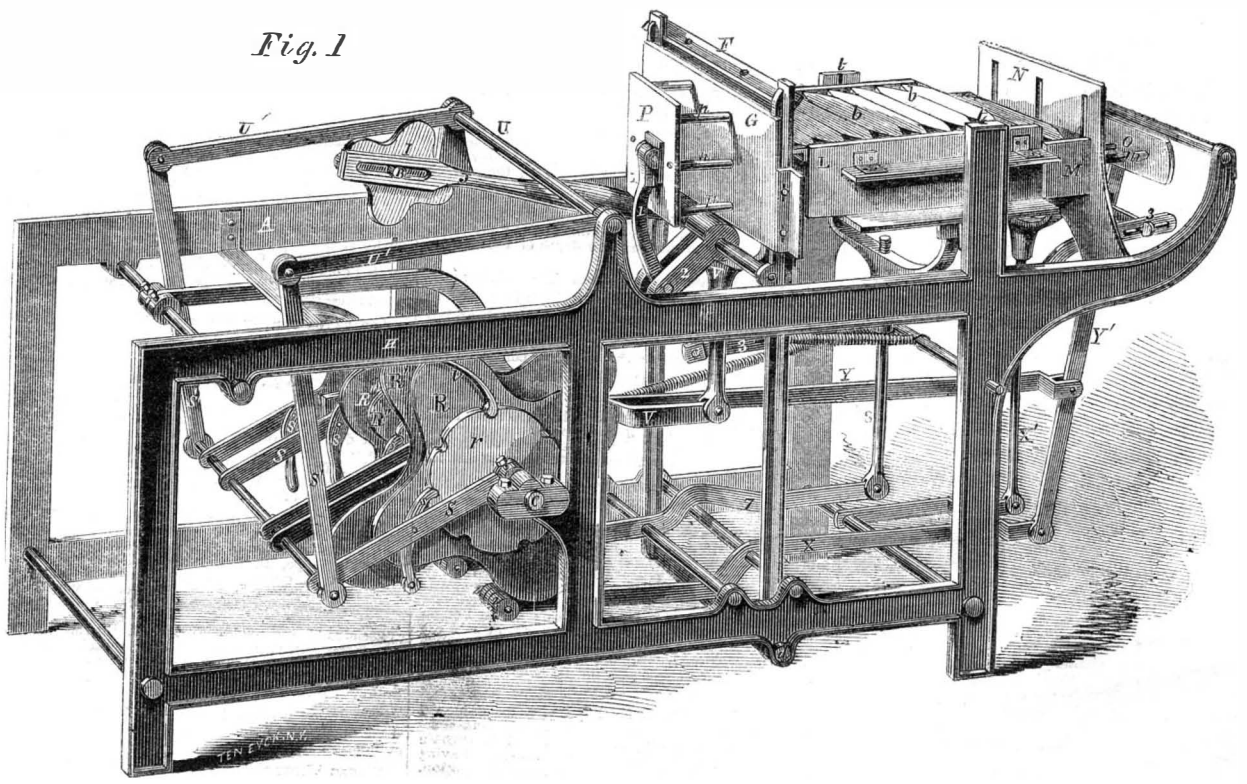
CHEETHAM'S IMPROVED LOOM.

Fig. 1



Improved Loom.

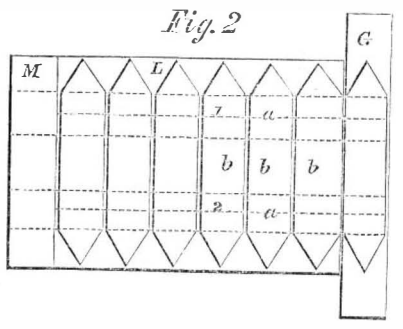
By means of this invention as many shuttles can be used in a power-loom as may be necessary to produce any pattern, and the lifting of the weight of the number of shuttles, as in the common arrangements, is obviated, only the shuttles in use being moved, so that the loom can be driven at a great speed.

Fig. 1 of our illustrations shows a perspective view of the arrangement, which is placed at the side of an ordinary power-loom. The special arrangement illustrated is designed for weaving two-ply carpets, but of course it can be applied to three-ply or other pattern fabrics.

A is the side-frame of the loom and B is the end of the driving-shaft, carrying the cam, I, and operating, by gearing not shown, the cam shaft, C. From B the lay is operated in the usual manner, but the lay does not carry the shuttle boxes, as will be shown hereafter. A similar apparatus to that depicted above is placed on the opposite side of the loom. H is a frame outside of and parallel with A, and F is one of the shuttle boxes, two in number, one below the other, and G is the vibrating frame that moves on centers, *d*, and which carries F. The shuttle boxes can slide up and down in the frame, G, so that each may be brought in line with the raceway of the loom. G has a shorter vibratory motion than the lay, moving back with the lay so far that the back of the shuttle box, which is on a level with the raceway, ranges with the face of the reed when the lay is in its most backward position, and advancing with the lay, not so much forward, but stopping half way and then becoming stationary. This motion of G is provided for by the cam, I, and the rod, J. The picker staff (not shown) is attached to G, and can be operated by any of the known devices. L may be called the shuttle-frame and is the feature of the invention, for it carries the shuttles, *b*, that are not in use. It occupies a central position in front of G and has an upper and lower bed, each of the width of a shuttle's length, and long enough to contain as large a number of shuttles as may be desirable, arranged one before the other and close together. The shuttles are arranged in the frame, L, in such order with respect to the colors of the yarn that may be necessary to produce the pattern, but it is not requisite that more than one shuttle, containing one color, should be used. Close in front of the shuttle-frame, L, is a single shuttle box, M, which is fitted to slide up and down on guides in an upright stationary plate, N. M is open towards L, so that the shuttles may be moved from L on to it as we have described, and M has a vertical movement for the purpose of bringing it on a level with either bed, L. *m* are pushers, attached to a plate, O, for pushing the shuttles from L into the shuttle boxes, F, and they slide horizontally through the plate, N. O is provided with guide pins that are attached to N, and on which it works. These pushers act so as to push the shuttle from M on to either bed of L, as it is elevated or depressed after it has received one from the top bed and has descended. Holes are provided in the back of M through which the pushers can work. In front of the vibrating frame, G, and passing through it, are pushers, *p*, attached to a plate, P, that moves on guides, *n*, and these pushers, *p*, pass through holes in the backs of the two boxes, F, and deliver the shuttles on to the top or bottom bed, L, as the case may be.

We will now, for the sake of illustration, suppose that the shuttles containing the colors are arranged on the top bed of L in the proper order for forming the pattern, and that they are moving toward shuttle-frame, G. L must remain stationary with its upper shuttle bed on a level with the raceway. The shuttle to be thrown out must be brought into the upper box, F, which must remain on a level with the raceway and the upper bed of L until the change is effected. The box, M, must also be on a level with the upper bed of L. The change takes place during the stoppage of G, while the lay completes its forward movement. The change is made by the pushers, *p*, moving forward and the pushers, *m*, moving backward, the former to push the shuttle out of the upper box, F, on the bed of L, and the latter to push the shuttles on the lower bed of L, so that the rearmost one will fall into the lower shuttle-box, F. The pushers, *p*, in pushing the shuttle out of the upper box, P, causes the foremost one to pass into the box, M, which, after receiving it, drops done to the level of the lower bed of L, and the pushers, *m*, again move back through the holes in M, and push its contained shuttle on to the lower bed of L. After *m* have been withdrawn from M all the pushers remain stationary until another change is effected, when the same operations are repeated. The change from the upper to the lower box, F, and *vice versa*, is effected in a manner well known to weavers, by the rise and fall of the boxes. The order of succession of the boxes may be reversed by merely elevating the frame, L, to bring its lower bed on a level with the raceway. In many looms, however, this frame may be made stationary. When L is elevated then M requires also to be elevated, and another pair of pushers have to be added above as M takes the shuttle from the lower bed of L and delivers it into the top one. The driving apparatus for operating the charge motion

Fig. 2



consists of five peripherical cams, R R' R" R'", and another which is not seen, tur ing loosely upon the shaft, C, the cams being operated at proper intervals by the action of a series of pawls, *s*, attached to a frame, S, upon a series of ratchet-wheels, *r*, secured to the cams. The frame, S, vibrates on the shaft, C. S rises and falls once during every beat of the lay by the action of a cam placed upon the shaft, B, of the loom upon a roller attached to one of the arms, U' U', secured to a rock-shaft, U, that works in bearings in the frame, A H. The frame, S, is suspended from U' by rods, S'. The ratchet-wheels, *r*, have stop pawls, *i*, applied them. The pawls, *s*, are all so controlled by the Jacquard machine as to be kept out of gear until the proper time for performing the several operations necessary to effect the changes of the shuttles, and then allowed to fall nto gear and move the cam one eighth of a revolution. The lifting and lowering of the shuttle-boxes, F, is effected by the cam, R", a lever of the third order, V, and a forked lever, V'. Two cams, R and R', are employed to raise and lower M. Both these cams act on rollers, *z*, on each side of the end of a lever, X, that actuates a forked rod, X'. The pushers are operated by the cam (not seen), by a rod, Y, a lever of the third order, Y', attached to the pusher plate, O, a lever, 1, whose fulcrum, 2, is a crank on a rocker-shaft, and a link, 3, connected by a pin and slot to Y', operates P. These cams are all the proper shape to give the requisite motions to the parts at the proper times, and springs are employed to bring back the pushers into their normal position. The raising and lowering of the shuttle-frame is effected by R'", a lever, 7, and forked rod, 8. A frame similar to the one illustrated will be placed on both sides of the loom, and by adding another shuttle-box, F, and forming the cam the proper shape, or having a proper system of cams, a three-ply can be woven as well as two. The other mechanism will answer equally well for a three as a two-ply loom. All other looms have to be stopped when the bobbin is done to take out the empty shuttle and put in a full one, but in this one, the weaver, seeing that a bobbin is not likely to weave another change, can take it out of the frame and replace it with a full one.

Fig. 2 shows a diagram of another method of moving the shuttles which the inventor proposes to use in place of the pushers. The shuttle-frame and boxes would be provided with grooves, *a a*, in which bearers, 1 2, should have free play and be capable of rising a little above the bottom of the frame, so that the shuttles, *b*, will rest on them, and also of falling beneath the frames, so that the shuttles could rest on the bed. These bearers could be operated by any suitable machinery, and the method of operating is as follows:—The loom should be started with both shuttles on

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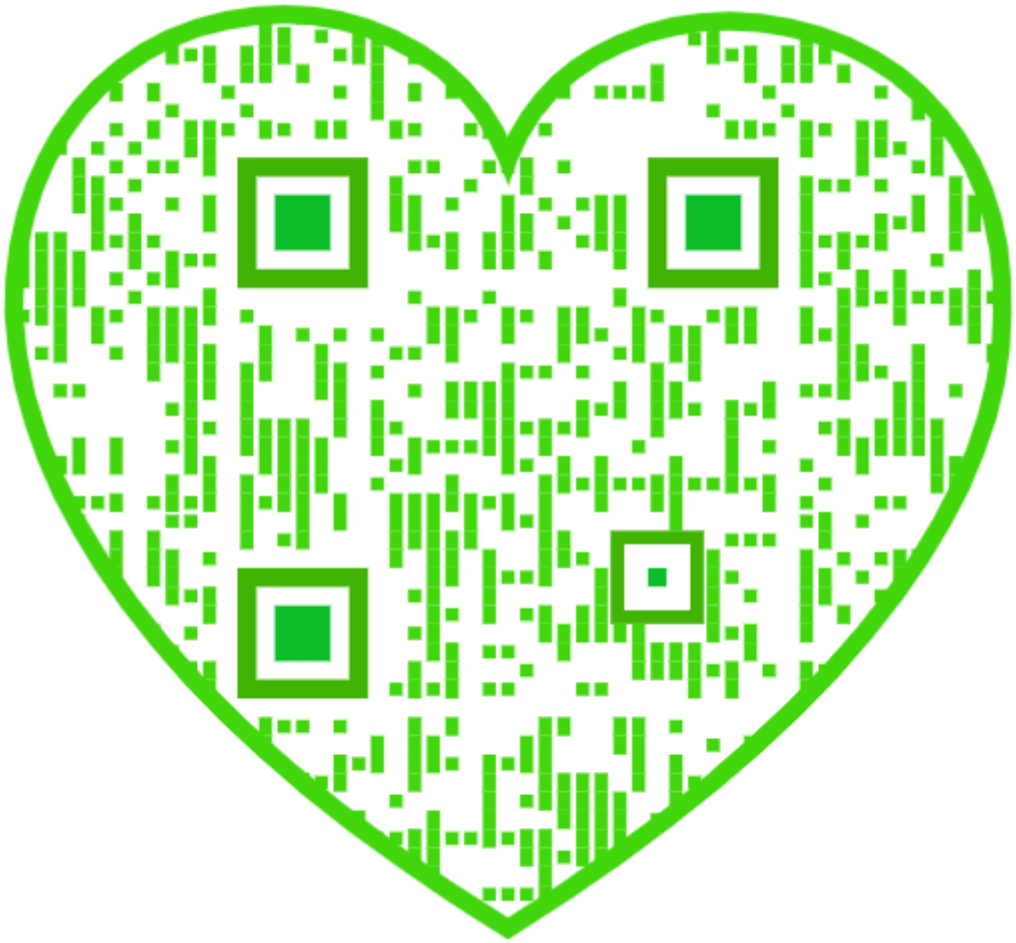
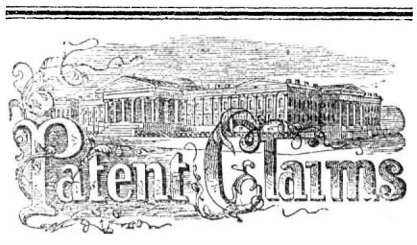


the right side of the lay, the ground shuttle in the top box and the figure shuttle in the bottom one. At the first pick the ground shuttle is thrown out of the top box, and the bearers are moved forward in the bottom frame to be ready to take the shuttle out of the bottom box in the lay on the frame, and the bearers in the top frame are also moved forward to carry a shuttle; when the lay is coming up to the cloth the bearers drop and leave the shuttle in the box. At the second pick the figure shuttle is thrown out of the top box, the bearers in the bottom frame are moved back carrying the shuttles with them; when this is done M is raised to bring a shuttle level with the top frame. At the third pick the ground shuttle is thrown from the top box of the left side into the top box of the right side, and the bearers in the top frame are moved back. And at the fourth pick the figure shuttle is thrown from the left side into the bottom box of the right side, and then the shuttles are in the same position as when the loom first started.

This loom, to which, we are inclined to think, all others will have to give place for weaving pattern fabrics, is the invention of W. H. Cheetham, Jr., of New York City, and any further information may be obtained by addressing him at Higgin's Carpet Factory, foot of Forty-third street, New York. The patent is dated April 5, 1859, and a notice of it will be found on page 270 of the present volume of the SCIENTIFIC AMERICAN.



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*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

COTTON PRESSES—E. H. Adams, of Talladega, Ala. I claim the combination and arrangement of guide-rod, D, toggle levers, E E, connecting rod, H, lever, G, and rack-lever, I, all operating substantially in the manner and for the purposes set forth.

[The nature of this invention consists in a combination of levers, connecting-rod and guide-rod for operating the follower-block and guiding it while entering the ball-box, whereby a superior cotton press is obtained.]

SURGICAL SPLINTS—David Ahl, of Newville, Pa.: I claim, as a new article of manufacture, my splint, made of the ingredients and in the manner set forth,

STENCIL BRUSH—V. R. Allen, of St. Louis, Mo.: I claim the mode of making the handle of the brush in two parts, and fastening the two parts by means of a screw, turned on the wedge, (which I term a wedge-screw,) which is driven through the bristles in the iron band, thereby wedging the bristles in the band. and enabling the main handle to entirely cover the ends of the bristles and band, which prevents the handle and bristles, when in use, from working through the iron band holding the brush together.

CUT-OFF GEAR OF STEAM ENGINES—E. R. Arnold, of Providence, R. I.: I claim, first, The combination of an adjustable cam, or sector, H' H2, fig. 4, or its equivalent, located on the rock-shaft; a stop-block, J' J2, fig. 5, or its equivalent, and an arm, I, I2, fig. 3, or its equivalent, attached to the devices which lift the valve, the three so combined operating to regulate the cut-off of the steam, in its passage into the engine, at any desired point of the stroke, in the manner and on the principle substantially as described.

Second, I claim the same combination above specified, for the purpose of working the exhaust-valves of a steam engine, by means of the same rock-shaft and eccentric motion with which the steam-valves are operated.

VARIABLE EXHAUST OF LOCOMOTIVE ENGINES—Wm. S. G. Baker, of Chicago, Ill.: I claim the plug, E, arranged in combination with the shell, D, and with the exhaust pipes, A A', of a double cylinder steam-engine, in such a manner that the exhaust of each cylinder can be varied while both are separate from each other, substantially as and for the purpose specified,

[This invention consists in arranging over the exhaust-pipe a rotary cylindrical plug, with different sized openings, which are brought to correspond with the openings in the exhaust-pipe and with the openings of the pipes leading therefrom to the chimney, by means of gear-wheels, which are easily operated from the Engineer's stand, and the whole is so arranged that the steam from the two cylinders is kept separate until it reaches the chimney, and that the opening of the exhaust-pipe for each cylinder is raised separately.]

SEWING MACHINES—Abraham Bartholf, of New York City: I claim applying the said lever to work on a fixed fulcrum in combination with a friction clamp, which, though it permits the said lever to be moved by and with the needle-arm, or needle-carrier, during a portion of the movement of the latter in either direction, for the purpose of drawing back the thread through the cloth, and completing the stitch, and letting it slack again to form the loop of a succeeding stitch, holds the said lever in a positively stationary condition during the first part of the movement of the said arm, or carrier, in either direction, and so prevents the thread getting slack till the needle has entered the cloth, and prevents its being drawn up through the cloth till the heel of the shuttle has arrived at the loop, substantially as described.

And in combination with the thread-controlling lever, constructed and applied as specified, and operated as described by the needle-arm, or needle-carrier, I claim the stationary eye, k, made adjustable, relatively to the said lever, substantially as and for the purpose set forth.

[This is a novel and very effective mode of applying and governing the operation of a thread-controlling lever, by which the needle thread is drawn back through the cloth to draw up the loop completely to the stitch, and held back to prevent its getting slack during the first portion of the descent of the needle, and before the point of the latter enters the cloth. There is also a novel arrangement of an adjustible eye in combination with the thread-controlling lever, for the purpose of adapting the operation of the thread-controlling lever to sewing different thicknesses of material with the same degree of tension on the needle-thread, and with the same tightness of stitch.]

SEEDING MACHINES—E. O. Baxter, of Foreston, Ill.: I claim, first, The clearers formed of the bars, i, i, placed on the seed tubes, F, connected with the bar, I, and operated through the medium of the lever, J, or its equivalent, substantially as and for the purpose set forth.

Second, The frame, A, fitted to the axle, B, as shown in connection with the cams, t, t, interposed between the axle, B, and the frame, A, substantially as shown, so as to raise the frame, A, when desired, to throw the seed-distributing device out of gear with the driving wheel.

Third, The arrangement of the frame, A, lever, N, connected with the frame, A, by the rod, V, and the upright, M, on draught-pole, D, substantially as shown, for the purpose of regulating the depth of the furrows as described.

[There is a class of seeding machines which are designed for planting or sowing seed either broadcast, in drills, or in hills, and the present invention is an improvement on such machines. The object of it is to place the machine under the complete control of the driver, and obviate various difficulties hitherto attending the operation of such machines.]

ARTIFICIAL LEGS—Douglas Bly, Rochester, N. Y.: I claim, first, Curving or deflecting the jointed extremities of the bars, J, so as to bring their axes of motion back of their line of direction, substantially as and for the purpose set forth.

Second, I claim the cord, T, and spring, X, acting upon the parts, D and L, substantially in the manner and for the purpose set forth.

Third, I am aware that metallic springs have been employed to similate the functions of the natural muscles; but experience has proved their inadequacy, both as respects the results obtained and their durability. I am also aware that india-rubber, or elastic cords, have been used for the same purpose, and with no better results; and these I do not claim; but I claim the combination of the non-elastic tendon, F, with the india-rubber spring, E, in such a manner that the required effect is derived from the compression and expansion of the material, and not from its elongation and contraction, substantially as set forth,

SEWING MACHINES—A. H. Boyd, of Saco, Maine: I claim the employment of lever, I, a shoe and shoe-shaft, spring, j, plate, b, and sliding bar, h, with an under feed-plate, e, the shoe and the feed-plate having an intermittent direct horizontal reciprocating motion, and the shoe having an intermitting direct vertical reciprocating motion, the same being given substantially in the manner specified and for the purpose set forth.

APPARATUS FOR COOLING BEER—James Boyle, of Roxbury, Mass.: I claim the combination with two or more vessels, containing a series of tubes inserted in diaphragm plates, so arranged as to allow communication from the upper part of each vessel to the lower part thereof, and vice versa, by means of and through the said tubes of pipes, so arranged on either side of the diaphragm as to connect the said vessels alternately at the top and bottom thereof; and of a pump or any suitable device for forcing beer or any other liquid to be cooled down through one set of tubes and up the other, while a supply of cold water surrounding said tubes is forced in a direction opposite to that of the liquid contained therein, substantially as set forth.

DRILL STOCK—M. S. Brooks, of Chester, Conn.: I claim the arrangement and combination with a spiral, or screw-shaped shaft, A, of a tube, D, ratchet, a, and stop, e, within the socket, E, as and for the purpose shown and described.

[A screw-shaft or rod is employed in this invention, with a tube and ratchet and socket fitted thereon, and so arranged that the screw-rod will be rotated, in one direction only, by the moving of the socket and tube back and forth on the screw-shaft.]

PLUG FOR BLASTING ROCKS—J. D. Buckley and S. F. Mosher, of Schaghticoke, N. Y.: We claim the combination of the tapered screw with the expanding metallic plug, having ledges, or other equivalents, to penetrate the rock, and provided with an aperture for the fuse, as set forth.

MACHINERY FOR HARDENING HAT BODIES—George E. Cowperthwait, of Danbury, Conn.: I claim the method of hardening hat bodies by means of a cradle, sustained in an inclined position, and having a tremulous movement, substantially as set forth.

I also claim the method of subjecting hat bodies to greater or less pressure during hardening, by inclining the cradle of the hardening machine to a greater or less extent, substantially as set forth.

ROCKING TOY—J. A. Crandall, of New York City: I claim the flat-wound springs, C C, pole or bar, D, elastic string, F, pin or thumb-screw, i, or their equivalent, in combination with the box, A, and frame, B, arranged and operated in the manner and for the purpose set forth as shown.

MACHINE FOR UPSETTING TIRE—C. L. Crowell and Robt. Smith, of Peoria, Ill.: We claim the combination of the lever and the intermediate slide, arranged substantially as described, for the purpose of giving movement to the sliding jaw.

DRAWING HEADS FOR SPINNING MACHINES—James E. Crowell, of Chelsea, Mass.: I claim so constructing and gearing the two pairs of drawing rollers, D2 d2 and D3 d3, that each pair will draw and release the sliver or roving, and so allow the twist to pass and run back to the first rollers, D' D' d', substantially as and for the purpose set forth.

[The principal object of this invention is to draw and spin a sliver as it is delivered from the doffer off a carding machine. To effect this it is necessary that a portion of the twist be allowed to run back as far as the back drawing rollers, in order that the sliver may have some twist in it at the time of the drawing operation; and the invention consists in so constructing and gearing the pair of drawing rollers, which are arranged next the spindles, commonly known as the third drawing rollers, and the pair behind them, commonly known as the second pair, that each pair will operate intermittently in turn with the other pair, each pair letting go as the other pair takes hold of the sliver, by which means the twist is allowed to pass the rollers and run back to those which first receive the sliver and from which the drawing takes place.]

SOAP—Wm. Dawes, of Washington county, Tenn.: I claim the use of the ingredients, when combined in the proportions set forth, the whole forming an improved soap.

TUYERE—Geo. W. Dean, of Glenn's Falls, N. Y.: I claim the adjustable rotating chambered cylinder, C, arranged substantially as shown, with the slot, B, in the bed-plate, A, and relatively with the blast-pipe, D, to operate as and for the purpose set forth.

[The object of this invention is to obtain a tuyere by which the blast is placed under the control of the operator, and made to act upon the fire in different ways to suit the character and nature of the work, and thereby greatly facilitate its progress. The invention consists in the use of a rotating cylinder, provided with a series of chambers, having orifices of different sizes variously arranged and placed relatively with a blast pipe, and an opening in the bed-plate, whereby the desired end is attained.]

CULTIVATORS—Oliver H. Dennis, of Altona, Ill.: I claim the arrangement and combination of the hinged handles, C, C, hinged side-beams, B, B, and connecting bars, H H, in relation to the central beam, A, substantially in the manner and for the purpose specified.

STRAW CUTTERS—J. B. Drake, of Goshen, Ind.: I claim the arrangement of the hinged forked feeding pawl frame, Q, feeding and stop pawls, P and T, centrally arranged ratchet wheel, N, spiked feed-roller, M, and rising and falling knife frame, substantially as and for the purposes set forth.

LAMPS—Jno. L. Drake, of Cincinnati, Ohio: I claim, first, A wick-tube for containing two or more flat wicks, one at least of which wicks is a conductor, said tube having a double chamber, brace and opening, as stated, so that the burning wick may receive the oil from the conductor, and still be free to move upon or against it, as it is raised or lowered, to regulate the burning, substantially as described.

I also claim, in combination with a slotted and perforated dome, and a flat wick for burning heavy oils, an auxiliary flat wick and wick tube, substantially as herein described and for the purpose stated.

APPARATUS FOR EVAPORATING SACCHARINE JUICES—Daniel I. Durfey, of Croton, Ohio: I claim, first, A descending series of evaporating pans, each having a well or depression on the side next its immediate successor in the range, closable by sluices, substantially as set forth.

Second, The arrangement of the sluices, B, alternately on the right and left of the range, when used in the described combination with the wells or depressions referred to, for the purpose set forth.

Third, The strainer, D, in the described combination with the clarifier, A, operating in the manner and for the purpose set forth.

WATER INDICATOR FOR STEAM BOILERS—John L. Frisbie, Cincinnati, Ohio: I claim, first, The described combination and arrangement of the box, C H, adjustable pipe, B, I, J, valve, K, sleeve Q, q, and sector, M N, operating in the described connection with the float-arm, O, for the purpose of varying the point of alarm from the outside of the boiler, as set forth.

Second, The cogged sector, M N, provided with a segmental slot, n, in the described combination with the sliding sleeve, Q, q, float-arm, O, and bolt, p, to enable the application of the alarm to any part of the boiler, as set forth.

NUT CRACKER—Russel Frisbie, of Middletown, Conn.: I claim the nut cracker, substantially as described, as a new and improved article of manufacture.

WATER WHEELS—Omri C. Ford and Jarvis O. Ford, of Collinsville, Conn.: We claim the application of the reversed curved buckets, or guides, to form a reversed action centrepetal and centrevent turbine water wheel, in combination with the inner and outer cut-off, F and K, in the manner substantially as set forth and described.

STRAW CUTTERS—A. W. Fox, of Athens, Pa.: I claim, first, The arrangement described and shown of the wheels, D and E, or their equivalent, in connection with the crank, G, connecting rod, H, sliding frame, I, and shafts, B and C, by which I obtain an accelerated upward and retarded downward motion to the knife of a straw cutter, as set forth.

Second, The combination of the sliding frame, I, with the knife, J, sliding in the said frame by means of the action of the angular slot and roller, or their equivalent, by which combination of parts a drawing cut is given to the knife, without interfering with the attachment and operation of the connecting rod, H, communicating motion from a shaft placed crosswise to the machine, as set forth.

ARRANGEMENT OF KEY-BOARD FOR PIANOS, ETC.—Alfred Gould and Cyrus Marsh, of Seneca Falls, N. Y.: We claim the arrangement of two, three or more ranges of keys of the key-board, in the manner and in relation to each other substantially as and for the purposes specified.

SEWING MACHINES—Joshua Gray, of Medford, Mass.: I claim, first, The combination of the reciprocating bar, G, with its side inclines, 10 and 11, and upper incline, w, with the bar, N, stop, v, and adjustable stop, t, arranged and operating as described, for the purpose set forth.

Second, In combination with the slide-bar, G, which operates the feeder, the bent lever, f, and universally adjustable cam, I, the several parts being arranged to operate substantially as described, for the purpose set forth.

WEIGHING SCALES—Wm. D. Guseman, of Morgantown, Va.: I claim in a weighing apparatus a pendulum drum or roller, which has, in addition to a rolling motion, a traveling movement, substantially as and for the purposes described.

I also claim, in combination with a rolling and traveling drum or roller, and an index, a traveling vernier, or dial, substantially as described.

I also claim the combination of the horizontal levers, G, of a platform scale, with the pendulum drums, C, and bands, F, substantially in the manner and for the purpose described.

MACHINE FOR ROASTING COFFEE—Josiah D. Harrington, of Rochester, N. Y.: I claim, first, The construction and arrangement of the divided handle, h, whereby the crank, C, not only serves to hold the two halves of the ball together, while rotating, but also to lift up one-half of the ball when moved into the position shown.

Second, I claim my method of uniting the two halves of a coffee-roaster, by means of the hinge, E, formed of the curved jaw attached to one half of the ball and passing into a slot in the second jaw, said slot having the pin, R, beneath which the curved jaw passes.

MODE OF APPLYING LEVER POWER—Elijah Harris, of Princeton, Ill.: I claim the use of a weight, B, a single or double lever, C, axle and pivots, D, d, acting in combination with the circular plate, E, ratchet-clicks, G, and ratchet-wheel, H, in applying lever power to machinery, substantially in the manner and for the purposes specified.

COTTON PRESS—Joseph Hawthorn, of Thomas Co., Ga.: I claim the combination of the screw, B, the tap-block, C, and the levers, D and H, with the packing-cases, M, and their followers, G, substantially in the manner and for the purpose described and shown.

SEWING MACHINES—Albert H. Hook, of New York City: I claim the combination of the cam, b, the lever, e, and spring, g, arranged and combined substantially as and for the purposes set forth.

COOKING STOVES—Sherman S. Jewett, of Buffalo, N. Y.: I claim the bricks, B, B2, B3, when constructed, arranged and supported within the stove, for the purposes of an oven, substantially as described.

MACHINE FOR MANUFACTURING PICKET FENCING—Wm. W. Johnson, of Clarksburgh, Va.: I claim, first, Operating a series of twisters, B, by means of pulleys and cords, arranged as set forth, so as to give a twist and reverse twist to the wire, in combination with vibrating fingers, J, hollow shafts, C, and tension plates, S, or their equivalents, substantially as and for the purposes set forth.

Second, I claim the segmental roller, N, constructed of the pieces, r r' r'', for the purposes explained.

[This machine makes wood and wire fences well and with great rapidity, so that they are durable and light.]

ADJUSTABLE CANOPY FOR RAILROAD CARS—Isaac E. Jones, of Cincinnati, Ohio: I claim the combination of springs, covers and hinges, all arranged and operating substantially in the manner and for the purposes set forth.

CENTRIFUGAL GUN—Wm. Joslin, of Cleveland, Ohio: I claim, first, Arranging the barrel, G, upon the same shaft with cog-wheel, F, which is secured near the periphery of the plate, I, and revolving the barrel around the wheel, K, substantially in the manner and for the purpose set forth.

Second, The combination of the bevel and spur gear wheels with the plate, I, and barrel, G, the same being arranged in the manner and for the purpose specified.

Third, I claim the arrangement of the slide, a, with the barrel and bevel table, d, for the purpose of elevating the balls to the barrel, substantially as is set forth.

Fourth, The arrangement of the revolving hopper bottom plate, J, and cylinder, e, for the purpose of conveying the balls down to the barrel, as is fully set forth.

PUMPS—Albert B. Keeley and James S. Beck, of Philadelphia, Pa.: I claim the combination of a solid or valveless oscillating piston with the peculiar shaped piston-chamber, and with the upper and lower valves, all arranged and operating substantially as and for the purposes set forth.

BREAST PADS AND PERSPIRATION SHIELDS—Henry C. Lester, of Brooklyn, N. Y.; I claim the combination of the arm-pit shields or protectors, H, and breast pads, D, substantially as described, so as to produce a new article of female apparel of the character set forth.

RAILROAD FROGS—David D. Lewis, of Tamaqua, Pa.: I claim the steel point, K, dovetailed to the body of the frog, in combination with the tread-plate, K, and the block, i, when the said tread-plate overlaps and is riveted to the said point, and when the block, i, is of such a tapering or wedge-shaped form that, during the process of riveting it and the tread-plate to the body of the frog, the said block may serve the purpose of driving the point tight up into its socket, for the purpose specified.

VENTILATING HATS—Arthur Maginnis, of Philadelphia, Pa.: I claim the combination of the perforated-hat body, the perforated sweat leather and the intervening corrugated band, C, when said band is provided with corrugation upon its two sides and made plain and smooth on its rear and front, the whole being constructed and arranged substantially in the manner and for the purpose specified.

FILTERER AND PURIFIER—Robt. A. Maingay, of Pottsville, Pa.: I claim, first, The combination of the lime water hopper, D, agitator, h, turbine, f i i, and hogshead, A, substantially as and for the purposes set forth.

Second, The combination of the alkali kegs, E, hogsheads, A1 A2, and turbine, F o o, substantially as and for the purposes set forth.

Third, The arrangement and combination of the purifying and filtering hogsheads, A A1 A2 A3, filtering tank, C, turbines, F o o f' i i, purifier and alkali kegs or hoppers, D E, substantially as and for the purposes set forth.

[The mine water of coal regions is found, by analysis, to be strongly impregnated with carbonic acid, sulphuric acid, large quantities of alum, and sulphate of iron. These properties, as may be well known, render it very destructive to steam boilers and other apparatuses used about mines. The object of this invention is to deprive the water of those destructive properties, and at the same time filter it so that it will be useful for mechanical and domestic purposes. The nature of the improvement consists in a peculiar arrangement of a series of purifying and filtering hogsheads, a large filtering tank or reservoir, a series of purifier kegs or hoppers and a series of turbines, whereby the above-named results are accomplished in a speedy, perfect and economical manner. This invention is very highly spoken of, and those who have used it say it saves them individually, by avoiding constant repairing and often substitution of new boilers, to the amount of several thousand dollars per annum.]

ANTI-FRICTION SUPPORT FOR THE BACKS OF RUDDERS—Albert H. Manchester, of Providence, R. I.: I claim the device or apparatus described, viz, supporting the rudder from behind by means of a backer or brace rising from the deck, or attached above it, having rollers in its face, constructed, arranged and operating substantially as described.

GAS RETORTS—Alfred Marsh, of Detroit, Mich.: I claim the employment of the secondary lid, h, for the purposes set forth, when the same is arranged and connected with the feed-pipe, substantially as shown and described.

COMPOSITION FOR EMERY STICKS AND WHEELS—Thos. J. Mayall, of Roxbury, Mass.: I claim the composition for the manufacture of emery wheels, sticks, and tools of more or less flexible nature, formed of gutta-percha or india-rubber and sulphur, emery and olive oil, substantially in the manner and for the purposes set forth.

MACHINE FOR SAWING BEVELED SURFACES—John McDiarmid, of Brooklyn, N. Y.: I claim the employment of the oscillating frame, B B, in combination with the center wheel, O, central flange, N, Fig. 11, and saw, T, or cutters, t, Fig. 5, when the same shall be constructed in the manner described and for the purpose specified.

METALLIC SEALS—Chas. A. McEvoy, of Richmond, Va.; I claim the use of a paper label, or its equivalent, in combination with a metallic seal, substantially as and for the purpose specified.

SEEDING MACHINES—Chas. Messenger, of Warren, Ohio: I claim the lever, b, arm, c, levers, e, and spring, h, when arranged substantially as described, and in combination with a combined seeding-machine and ground roller.

I also claim the studs, E E' and F F', rods, I I', and shaft, J, in combination with the cams. D D', substantially as set forth, and when used in connection with the seeding-machine and ground roller combined.

SCREW EXCAVATOR—Richard Montgomery, of New York City: I claim, first, Making the cylinder, a b, which encloses the screw, a, in a conical form, for the purpose of rendering the ascent and discharge of the earth more free and perfect, as set forth.

Second, Supporting the cylinder and screw by means of the hinged frame, u s s', substantially as and for the purposes set forth.

Third, Driving the cylinder, a b, and screws, a', by means of the gearing, y x e d, arranged and combined as described.

Fourth, Supporting and adjusting the front of the excavator by means of the friction ring, g, and chin or rope, n, as described.

Fifth, The curved swinging standard or derrick, p, for elevating the front end of the excavator without unfastening the chain, n, when desired, as described.

Sixth, The combination of the cylinder, a b, and screw, a', with the swinging-frame, u s s', derrick, p, and carriage, K, substantially as set forth.

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EXTENSION LADDER—Joel Moulton, of Boston, Mass.: I claim the improved extension ladder hose carrier, constructed substantially in manner and with its parts arranged and applied together as described, viz., with a series of single ladder bars, A B C, connected together, and provided with pius or handles, and having not only an extension line and sheaves connected with and arranged in them (the said bars) as explained, but a supporting platform and guide braces arranged at the upper part of the upper bar, as described.

I also clain the combination and arrangement of the water conduit, or hose-pipe director, and its guiding lines, with the extension ladder, constructed essentially in manner and to operate substantially as described.

METAL DRILLS—Jacob Murphy, of Half Moon, Pa.: I claim the shoulders on the drill, d, in combination with the braces, b b, and pin, p, upon the sliding frame, B B, substantially as and for the purposes set forth.

MACHINES FOR ROLLING AND MEASURING COTTON BAGGING—Thomas H. Murphy, of New Orleans, La.: I claim the described machine, or combination for simultaneously rolling and measuring bagging, consisting of an adjustable guide bar, F, sliding shaft, D, fitting into driver, B, the windlass and cord, E b, adjustable pressure roller, G, carrying cam, i, lever, J, indicating wheel, L, arm, K, pawl, l, and spring, M, when all said parts are arranged and combined substantially as shown and set forth, and for the purpose specified.

[This invention consists in the employment of an adjustable rolling shaft, adjustable pressure roller, a registering mechanism and an adjustable guide placed within a suitable frame, whereby woven fabrics may be measured with facility.]

MACHINES FOR HUSKING CORN—Jacob Naeher, of North Orange, N. J.: I claim the reciprocating troughs, c c, one or more, provided with pincers, I, in connection with the toothed plates or stripping combs, o o o p, and with or without the retaining plate, q, the whole being arranged to operate substantially as and for the purpose set forth.

[This is a good corn-husker, doing its work well and efficiently.]

METALLIC FRAMES FOR WINDOW BLINDS—Charles Neer, of Albany, N. Y.: I claim constructing frames for blinds of sheet metal, bent in a U form, and connected together substantially as specified.

I also claim the bent or folded strips, f f, provided with holes receiving the ends or tenons of the slats, as set forth.

MOP HANDLE—H. Norton and J. S. B. Norton, of Farmington, Me.: We claim attaching the mop cloth or yarn, B, to the handle, A, and to a slide, C, fitted on the handle, and arranged substantially as and for the purpose set forth.

[By this invention the mop cloth or yarn can be wrung out when changed with water, without, in the slightest degree, wetting or soiling the hands of the operator.]

MANUFACTURE OF BRICKS—Nelson Parmeter, of Gardner, Mass.: I claim a fire-proof brick or lining, composed of the above named ingredients, in the proportions set forth, and in the manner substantially as described.

SIGNAL DOOR BOLT—Chas. Page, of West Meriden, Conn.: I claim passing the pin which moves the bolt through the door, and permanently fixing to the projecting extremity thereof a segmental plate, so as to overlay the fixed symbol plate, and, in the manner set forth, communicate the desired intelligence.

MACHINE FOR PLANING OR SHAVING ICE—H. D. J. Pratt, of Washington, D. C.: I claim the machine or implement for cutting or reducing ice to small particles, as described, the same consisting of the arrangement in a hopper of suitable size and shape of rotating cutters, with or without a presser, the whole constructed and operating substantially in the manner described and applied to the purpose specified.

CULTIVATORS—Asa Preston, of Unionville, Ohio; I claim the construction of a combined plow cultivator, having the several parts so arranged that they can be easily attached or detached, as described, when said plow has the hinged wings, W, moldboard, H, bars, L M, and blades, J K, arranged and operated substantially as set forth.

WATER-WHEELS—Reuben Rich, of Albion, N. Y.: I claim constructing the pen-stock, A, dadoed joints, L, and bolts, I in combination with gates, G and G-2, and center scroll plate, B, and wheel, C, when constructed and operated in the manner and for the purposes specified.

WATER-WHEELS—Sylvanus Richardson, of Jericho, Vt.: I claim the float with hinges, as shown at point marked a, and the spiral or curved form of the lower part of the float, as shown at points marked b, combined with the extension downwards of the case below the scroll case, e, and with draft tube, h, as shown, substantially in the manner and for the purposes set forth.

WASHING MACHINE—John R. Rogers, of Sacramento, Wis.: I claim the combination in cylinder, B, of the diagonal slats, c c e C, with the two heads of the cylinder, when said heads are provided with holes of such a shape and form that they will collect and force the water in, and empty it at alternate ends of the cylinder, as the direction of its revolutions are changed, substantially as set forth.

WATER-WHEEL—Timothy Rose, of Cortlandtville, N. Y.: I claim forming the buckets, B, of four parts, a b c d, arranged or disposed relatively with each other, the hub, A, and annular plate, e, and with a scroll, C, specifically as shown and described and for the purpose set forth.

[This is an improvement on that class of water-wheels which rotate in a horizontal plane, and are acted upon and propelled both by the impacting and re-acting force of the water as it passes through the wheel.]

CAST-IRON GRINDING MILLS—John Russell, of Troy, N. Y.: I claim, first, The combination of the breaker, B, and internally armed hopper, A, with the upper grinder, I, and lower grinder, H, all arranged and operating together as set forth, for the purpose of feeding into the mill and grinding large substances, such as corn on the cob.

Second, I claim making the armed portion of the hopper of separate rings, N, provided with internal projections, b, and arranged and secured together in the mill, as and for the purpose set forth.

Third, I claim making the lower grinder of separate toothed rings, C, arranged and secured together upon the supporting plate, E, as and for the purpose described.

Fourth, I claim making the upper grinder of separate toothed rings, J, arranged and secured together in and to the supporting plate, K, as and for the purpose set forth.

SEEDING MACHINES—Thos. Short, of Danville, Ill.: I claim the swinging frame, D, when provided with a seed-distributing device, actuated by a wheel, H, and cutting furrow-shares, I, and fitted within a mounted frame, A, substantially as and for the purpose set forth.

[The seed-distributing device is placed in a swinging frame that is fitted within an outer mounted frame, and swivel furrow-shares are attached to the swinging frame, the whole being arranged so that it is better adapted for planting seed in newly-turned or plowed sod ground, and also prevented from operating imperfectly by the action or presence of weeds and other trash that frequently collects around the furrow-shares as the implement is drawn along.]

REFINING IRON IN THE HEARTH OF A BLAST FURNACE—Christian Shunk, of Canton, Ohio; I claim the employment of an auxiliary tuyere pipe within the hearth of the common blast furnace, when charged with molten iron, at such an angle as that the blast of air entering the iron may strike the circular wall of the hearth, as nearly as possible, at a tangent to its circumference, so as to cause the blast of air to pass round in the metal, giving the whole mass in the hearth a spiral motion immediately before the tapping of the furnace for the manufacture of pig-iron from the ore.

SEWING MACHINES—James C. Spencer, of Phelps, N. Y.: I claim the construction of a feeder and needle bar in one piece, or connected together, and the combination of the eccentric, D, and pin, F, with the needle bar, by means of the slot, s, for the purposes specified.

HARVESTING MACHINES—Wm. S. Stetson, of Baltimore, Md.: I claim, first, Connecting the finger bar to the frame of the machine by means of the saddle and its support, constructed and arranged substantially as described.

Second, In combination with the saddle, d, I claim the swiveling guide and swiveling lever, k, as set forth.

Third, I claim throwing the cutters in and out of gear by means of the shifting bar, t, constructed and operated substantially in the manner set forth.

HARVESTING MACHINES—W. S. Stetson and R. F. Maynard, of Baltimore, Md.: We claim, first, The double hinge joint at the end of the finger bar, consisting of the hinge, p, shaft, r, collar, s, and brace, t, arranged and operating in the manner described for the purpose specified.

Second, We claim the compound connecting-rod, m, constructed and operated as set forth.

Third, We claim so constructing or forming the upper part of the obtuse angle iron tooth bar and the base of the finger or tooth, that said base shall bear upon two plain faces of the said angle iron, in the manner and for the purposes set forth.

FOOT-POWER MACHINE—Frederick S. Stoddard, of Litchfield, Conn.: I claim, first, A two-throw crank, operated by one pitman, in combination with a lever and spring, or their equivalents, as described.

Second, The mode of attaching the spring to the foot-piece to operate on the pitman crank, in connection with the set screws for adjusting and reversing the motion, as set forth.

POTATO PLANTER—J. C. Stoddard, of Worcester, Mass.: I claim, first, The combination of the compound cam, K, hooked lever, I, and sliding crosshead, o, with cutter, p, attached, the whole arranged and operating substantially as and for the purpose shown and described.

Second, I claim arranging the plowshares, L, and covering-shares, M, on parallel rock-shafts, j k, so that a lateral and vertical adjustment can be given to the same, substantially as set forth.

[By this invention potatoes can be planted in hills at different distances, or in drills, at the option of the operator, and the dropping apparatus is so arranged that the quantity of potatoes deposited in a hill is measured, and the distance of the furrows made by plow and covering-shares, and the depth to which they cut, may be altered at pleasure.]

STOP-GAGE FOR WEATHER BOARDING, &c.—Worden E. Stoddard, of Horicon, N. Y.: I claim the use of the bar, A, forming a stop or support for boards and moldings, and the knob, C, the spur, D, and the adjustable slide, B, substantially as shown, for the purposes set forth.

PADDLE-WHEEL—John Thompson and M. L. Doty, of Chariton, Iowa: We claim the buckets of a paddle-wheel, arranged in combination with the segments, b, the weighted pinions, F, and the dogs, H, or their equivalents, to operate substantially as and for the purposes specified.

And in combination with the above-named parts, we also claim the arrangement of the spurs, j, or their equivalents, for the purpose of retaining the buckets in the proper position while the wheel is backing, substantially as described.

[The buckets of this paddle-wheel feather take up no backwater, and act equally as well in backing as in propelling the vessel.

PROPELLER—Chas. R. M. Wall, of New York City: I claim, first, An apron, G, arranged in such relation to a wheel, A, that it operates to propel a vessel, substantially as described.

Second, The arrangement of the rollers, E E', in combination with the apron, G, whereby the wheel is made to work at any dip, substantially as specified.

Third, The springs, g, or their equivalent, arranged in combination with the rollers, E', and with the apron, G, for the purpose of regulating the strain on the apron, substantially as set forth.

[This invention consists in arranging one or more elastic and water-tight bands or aprons in such relation to a wheel, with suitable rollers and stops, that, when the wheel is rotated, the combined action of these rollers and of the water causes the apron to sag in and to assume such a position that it acts very effectively in propelling the boat without raising any backwater.]

NEEDLE-CASE AND INDEX—Calvin D. Wheeler, of New York City: I claim a needle-case and index combined for sewing machines, as described, whereby the appropriate sizes of the thread and needles to properly work together is always determined and shown,

SEEDING CULTIVATORS—Nicholas Whitehall, of Newtown, Ind.: I claim the combination of the stirrups, o o, with the notched handles, N N, eye bolts, D, and hooks, F F, by which I am enabled to raise and secure the plow at any desired hight, substantially as set forth.

CEMENTS FOR ROOFING—J. Carpenter Worth, of Little Britain Township, Lancaster Co., Pa.: I claim the composition for roofing made up in the manner and of the ingredients proportioned and mixed, as set forth.

PUMP—John H. Young, of St. Louis, Mo.: I claim, first, Dividing the pump cylinder into two chambers, a a', by the division valve-seat plate, b, with its valves opening upwards, and uniting them by the water-way, E, substantially as described and for the purpose set forth.

I also claim the puppet valves, m m, connected to and operating with the buckets, K L, in the two chambers, so that, whilst they move with said buckets, they shall have action independent of them, as set forth.

I also claim, in combination with the hollow piston and stem passing through it, the causing of the upper valve, m, to close upwards against its bucket, substantially as described.

RAILROAD SWITCH—Jacob Youngman, of Sunbury, Pa.: I claim the arrangement of two guards, 4 4, so that a space, 5, exists between them at the point where the cars take an oblique direction to the switch rails, in order to run upon the lower portion of the main track on a frog plate, which has stationary frogs, 1 2, and a rail, 3, arranged on it, substantially as and for the purposes set forth.

[By this improved railroad frog the rails of the main track and siding or turn-out are kept closed or connected with the track below at all times, and in a condition to prevent a possibility of accidents by the running-off of the train, in case the switch should have been carelessly left or moved to the wrong position, as there is at all times an unbroken or continuous line for a train to take. This is a very excellent improvement, and should commend itself to railroad managers who have the care of human linife their hands.]

LOCK—Orson Billings, of La Grange, Ohio, assignor to himself and Morris Traver, of Clinton Hollow, N. Y.: I claim the combination of the guards or plates, E F H, constructed and arranged relatively with each other and the bolt, B, to operate as and for the purpose set forth.

I also claim the spring tops, c, when applied to the guard or plate, E, and the latter is used in connection with its fellow-guards, F H, for the purpose described.

[This invention consists in the use of a series of guards, arranged relatively with each other and with a bolt, whereby the lock is prevented from being picked or even opened with a proper key, unless the operator has a knowledge of the construction and arrangement of the parts. The invention is more especially designed for the doors of dwelling houses, and for use in those cases where an economical and secure lock is desired.]

HAND-PLANING MACHINE—Tyrannus B. Butterfield, of Indianapolis, Ind., assignor to Abijah Taylor and R. Stevenson, of Morgan County, Ind.: I claim the combination and arrangement of the frame, A, knife, D, feed roller, F, spring, H, and screw, I, when the whole is arranged, constructed and operated in manner substantially as and for the purpose set forth.

WINDOW SASH SUPPORTER—Sumner Cooper, of Windsor, Conn., assignor to himself, Thomas Denham and Joseph W. Briggs, of Cleveland, Ohio: I claim the combination and employment of the spring pinion pulley, C, with the rack or perforated plate, L, tube or box, I, pin, J, key, K, latch, H, substantially in the manner as and for the purpose described.

CONNECTING TOGETHER THE BRACES OF TRUSS BRIDGES—L. E. Truesdell, of Warren, Mass.: I claim the method described of constructing and interlocking the diagonal braces, for the purposes set forth.

FEEDING DEVICE FOR PLANING MACHINES—C. B. Cottrell, (assignor to himself and Nathan Babcock), of Westerly, R. I.: I claim the combination of the anti-friction and feed rollers, G L, applied to the class of planing machines described, and driven from one and the same shaft, H, by gearing, arranged as shown, to admit of a separate lateral adjustment of each, for the purpose set forth.

[The object of this invention, which is an improvement on one patented Oct. 5, 1858, is to facilitate the feeding of the work to the cutters and also to place the feeding device more fully under the control of the operator than formerly, so that the feed may be checked or stopped independently of the movement of the cutter head and still be driven from the same shaft.]

MACHINE FOR SHAVING STAVES FROM THE BOLT—Harry H. Evarts, (assignor to himself and P. E. Merrihew), of Chicago, Ill.: I claim, first, The employment or use of the reciprocating saws, F F, in connection with the swinging bolt frames, G G, operated by the wiper wheels, s, or their equivalents, substantially as and for the purpose set forth.

Second, The employment or use of the segment racks, h, operated substantially as shown, and connected by the pinions, g, with the right and left screw rods, H, having jaws, f f, placed thereon, for the purpose of dogging and undogging the bolts at the proper time, as described.

[A patent was granted this inventor for a stave machine March 23, 1858, and the present invention is designed to expedite the cutting of the staves from the bolt, and render the operation of the working parts automatic throughout.]

VALVES FOR DRY GAS METERS—Henry Howson, (assignor to A. Harris and J. W. Harris), of Philadelphia, Pa.: I claim, first, A pin, E, or its equivalent, fitted loosely to the valve and intervening between the valve and the driver, substantially as set forth, for the purpose specified.

Second, Constructing the driver in the form of an inverted cup, D, with driving pins in the inside, said cup being so arranged in respect to the annular flanch, e, of the valve, so as to serve the double purpose of maintaining the latter in its proper position and of preventing the access of tar to the driving pins.

SEWING MACHINES—Warren Millar, (assignor to himself and John Nutt), of Chicago, Ill.: I claim, first, The hook, h, when constructed and operated substantially as described, in combination with an eye-pointed needle, and the spool case, c, for the purpose specified.

Second, The combination of the flange, b, and space, x, or their equivalents, of the spool case, c, when constructed as and for the purposes described.

Third, The sliding supports, s s, or equivalents therefor, when constructed, arranged and operating in the manner substantially as described, for the purpose specified.

Fourth, I claim imparting to the spool case, c, the tripping or rocking motion, to receive the loop of needle thread from the hook, h, or its equivalent, in the manner and for the purpose described.

CORN AND COB MILLS—Wm. Sailor, (assignor to himself, Wm. S. Boyer and H. K. Boyer,) of Philadelphia, Pa.: I claim, first, The plates, i, i, with their saw teeth, when the said plates are secured obliquely on the spindle and adjacent to the burr, and when both the burr and plates are arranged, in respect to the shell, substantially as set forth.

Second, Forming the burr in three or more separate pieces, adapted and secured to each other and to the spindle, substantially as specified.

VINEGAR CRUET, OR BOTTLE—Geo. W. Simmons and Geo. H. Simmons, of Bennington, Vt., assignors to themselves and Norman Millington, of Shaftsbury, Vt.: We claim, as a new article of manufacture, a bottle, cruet, or other similar vessel, for containing liquids for table, culinary or household purposes, provided with the tubes, A and B, made and fitted to them, in the manner and for the purposes described and represented

RE-ISSUES.

GRAIN SEPARATORS—John R. Moffitt, of Piqua, O. Patented Nov. 30, 1852; re-issued March 23, 1858: again re-issued May 17, 1859: I claim the endless chains, d, composed of metallic links provided with protuberances or depressions, when used in combination with suitable driving chain gears to impart a positive motion to the straw-carrier of a threshing and separating machine, as explained.

GRAIN SEPARATORS—John R. Moffitt, of Piqua, Ohio. Patented Nov. 30, 1852; re-issued March 23, 1858; again re-issued May 17, 1859: I claim, in combination with a receptacle in which the tailings are deposited by the winnowing apparatus, the arrangement of the screw elevator, O, in relation to the threshing cylinder for the purpose of returning the tailings to be rethreshed, as set forth.

GRAIN SEPARATORS—John R. Moffitt, of Piqua, Ohio. Patented Nov. 30, 1852; re-issued March 23, 1858; again re-issued May 17, 1859: I claim the reversible screen, K2, and delivery spout, 1 2, m2, arranged, adapted and constructed substantially in the manner described with and to the discharging-spout of the "fanning mill" or "shoe" of a threshing-machine, so as to be isolated from the winnowing arrangement, and made to deliver at either one side or the other of the machine, as set forth.

GRAIN SEPARATORS—John R. Moffitt, of Piqua, Ohio. Patented Dec. 1, 1857: I claim the arrangement of disconnected shafts, H H', carrying pinion chain gears, E e, E', e', rotated at equal speeds from a single shaft or driver, and acting to drive the endless apron from its lower end, while permitting the escape of the straw through the lower openings of the apron, as set forth.

MACHINERY FOR PREPARING OVAL PICTURE FRAMES—Wm. Gardner, of New York City. Patented Aug. 17, 1858; re-issued March 15, 1859; again re-issued May 17, 1859: I claim the combination of a scraper, adapted to the form of the molding, with the revolving face-plate of a lathe, when the said scraper is so arranged to be self-adjusting laterally to the said molding, for the purpose set forth.

GRAIN SEPARATORS—John R. Moffitt, of Piqua, Ohio. Patented Dec. 1, 1857: I claim the construction and arrangement (substantially as described) of the rotary beater, A, within the apron, in combination with the falling sections, B''', operating in the manner and for the purposes set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853: I claim, first, An elevated binding table in combination with the platform for receiving the grain as it is cut, substantially as set forth.

Second, The combination with the binding-table of one or more binders' stands, on a lower level than that of the table, substantially as set forth.

Third, The combination of a binding-table with a binders' stand, having an elevated side for the binder to rest his legs against, and thereby steady himself without the aid of his arms, both of which are thus left at liberty to do the binding, substantially as set forth.

Fourth, The arrangement of the rakers and binders' stands, substantially as set forth, so that the grain may be raked from the platform and delivered upon the binders' table before the several binders' stands, in the manner substantially as set forth.

Fifth, The arrangement of the dumping-tray with the rakers' and binders' stands, substantially as set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853: I claim, first, The combination of the finger-beam and the main frame with a yielding coupling arm, J, whereby the progressive movement of the finger-beam over the ground will be controlled by the main frame, and its upward and downward movements by the undulations of the ground over which it is drawn, substantially as set forth.

Second, The combination of a yielding coupling-arm, J, and a yielding brace-bar, K, with the finger-beam and main frame, substantially as set forth.

Third, The combination of the yielding bars, J K and K', and the removable bolts, L' L2, or the equivalent thereof, with the finger-beam and main frame whereby the finger-beam may be allowed to slide loosely on the ground to adapt the machine to mowing, or be held firmly above the ground to adapt the machine to reaping, substantially as set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853; re-issued May 17, 1859: I claim the short finger-beam in combination with the yielding connection with the main frame or its equivalent, substantially as set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853: I claim the combination of the finger-beam with the hinges by which it is drawn, arranged above the plane of the cutter, substantially as set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853: I claim the combination of a counter-poise weight, or the equivalent thereof, with that end of the finger-beam next the main frame, to equalize its pressure upon the ground, substantially as set forth.

Also the combination of a counterpoise weight, or the equivalent thereof, with each or either end of the finger-beam, to diminish its pressure upon the ground, substantially as set forth.

GRAIN AND GRASS HARVESTERS—C. Aultman & Co., of Canton, Ohio, assignees of Philo Sylla and Augustus Adams, of Elgin, Ill. Patented Sept. 20, 1853: I claim the combination of a stop with the mechanism for connecting the finger-beam with the main frame, and allowing it to rise and fall, substantially as set forth.

DESIGN.

STOVES—David Hathaway, (assignor of Fuller, Warren & Co.,) of Troy, N. Y.

ADDITIONAL IMPROVEMENT.

ORE-CRUSHING MACHINES—Samuel F. Hodge, of Detroit, Mich. Patented May 26, 1857: I claim the alternate lifting and dropping of a stamper, or hammer, by means of the combination of the vertical rod with two or more clamping rollers, the peripheries of which are not complete circles.

COOKING STOVES—Samuel B. Spaulding, of Brandon Vt. Patented June 22, 1858: I claim the extension of the flues under the hearth, substantially as described for the purposes set forth.

EXTENSION.

THE MANUFACTURE OF INDIA-RUBBER FABRICS—Nelson Goodyear, late of Newtown, Conn., (Henry B. Goodyear, Adm'r.) Patented May 13, 1845: I claim the intermingling and combining fibrous substances with the gum in forming india-rubber fabrics, solid and firm in the body, with a smoothe surface resembling leather.

INVENTIONS EXAMINED at the Patent Office, and advice given as to the patentability of inventions, before the expense of an application is incurred. This service is carefully performed by Editors of this Journal, through their Branch Office at Washington, for the small fee of $5. A sketch and description of the invention only are wanted to enable them to make the examination. Address MUNN & COMPANY,
No. 37 Park-row, New York.

BOOKS RECEIVED.

THE EDINBURGH REVIEW. L. Scott & Co., 54 Gold street, New York.

THE ECLECTIC MEDICAL JOURNAL OF PHILADELPHIA. Edited by W. Paine, M. D., 130 North Fifth street, Philadelphia.

NEW ORLEANS MEDICAL NEWS. Edited by Drs. D. Warren Brickell and E. D. Fenner, 37 Gravier street, New Orleans.

THE AMERICAN JOURNAL OF PHOTOGRAPHY. C. A. Seely, A. M., Editor. Seely & Garbanati, New York.

L'INVENTION, par Ch. Desnos-Gardissal, Ingenieur Civil, 29 Boulevard St. Martin, Paris.

ALL THE YEAR ROUND. Edited by Charles Dickens. J. M. Emerson & Co., 37 Park row, New York.

ATLANTIC MONTHLY for June. Phillips, Sampson & Co., Boston.

SACRED MUSICAL GUEST. M. Bell & Co., 13 Frankfort street, New York.

THE MUSICAL GUEST. M. Bell & Co., 13 Frankfort street, New York.

DINSMORE'S AMERICAN RAILROAD STEAM NAVIGATION GUIDE. A necessary, reliable pocket companion for travelers.

SORGHO SUGAR EXPERIMENTS AND APPARATUS. An illustrated pamphlet. By F. M. Robinson, of the Keystone Iron Works, Conneutville, Pa.

SORGHUM SUGAR EXPERIMENTS AND IMPLEMENTS. Another treatise on this subject. By Hodges, Free & Co., Main street, Cincinnati, Ohio.

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New Inventions.

Rewarding a Military Inventor.

The London *Mechanics' Magazine* is justly severe on the British government for its disgraceful treatment of Capt. J. Norton, whose inventions have been noticed in our columns. It says :—"It seems a remarkable fact that while our governing classes have hearts so accessible to charitable emotions, and find so much time for 'labors of love' they should be sadly insensible to that, which in our plain way we prefer to charity, viz., justice and right. We say with as much confidence as sorrow that there is no civilized country under the sun in which the public administrators are more callous, more dead to honor, not to say common honesty, than they are in England. Especially is this true in respect to their conduct towards that class of men to whom this country owes far more of its material greatness than any other—the inventors and improvers of the mechanic arts." This is noble and independent language in our cotemporary and as true as it is noble. It states that the Minie ball in its best forms, the concussion fuse, the liquid fire shell, lead-coated balls for rifled cannon, and several other useful military inventions were first invented by Capt. Norton several years ago, and brought to the notice of government officials, but he neither received honor nor remuneration for them, nay, his inventions were ignored, were rejected by such officials, until years afterward when they were received from the hands of others as great and new improvements.

New Steam Boiler.

To obtain the full heating effect of any fuel, all the combustible gases, as well as the solid matter, must be allowed to meet and combine with their proper proportion of oxygen while in an intensely heated state. A considerable proportion of the effect of coal is usually lost in steam boilers by the escape of unburned hydrogen, and of the several compounds of which it forms a part.

Aside from the loss of volatile matter, properly so called, the solid carbon, when intensely heated and imperfectly supplied with air, is liable to absorb but one equivalent of oxygen and to escape as carbonic oxyd, instead of absorbing the two which are necessary for complete combustion. The change to carbonic oxyd evolves only one half—some experiments indicate but little more than one quarter—as much heat as a change to carbonic acid, and it therefore becomes important with all fuels to supply enough fresh air to completely burn these gases.

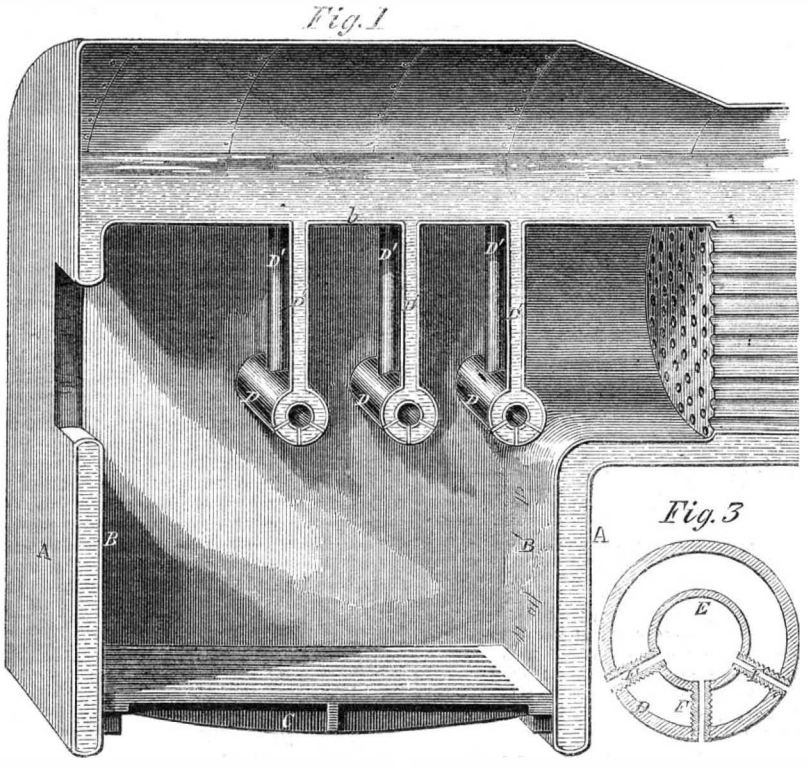
Small streams of air admitted above the grate become luminous and appear somewhat like jets of gas, but if the air is admitted in large, instead of finely divided currents, it seems to cool the furnace and produce more evil than good. The doors of furnaces have been frequently perforated, and tubular stays have, in some instances, been extended through the water-legs or sides of furnaces; but the small streams thus admitted extend inward only a little distance, and the great mass of the gases rising in the center of the fire escape unaffected and unconsumed into the chimney.

The object of the present invention is to supply such streams to the very center of the furnace. The chief difficulty in the way is to prevent the destruction of the apparatus by the intense heat. The inventors, Messrs. Samuel Pierce, of Troy, N. Y., and B. L. Griffith, of Hazleton, Penn., overcome this by enclosing air-tubes within water-tubes and providing for a very active circulation of the water, so that the double purposes are effected of protecting the parts and increasing the heating surface of the boiler.

Fig. 1 is a longitudinal section of a locomotive furnace with this improvement, Fig. 3 is a section of one of the air-pipes and its water-envelope on a larger scale, and Fig. 2 is a transverse section. A is the exterior shell, B *b* is the interior fire-box, and C is the grate. D is a tube of some six or seven inches diameter, connecting the two sides of the internal fire-box. D′ D′ are branches thereof, connecting this at several points with the crown sheet, b. E is a smaller pipe, some three inches in diameter, located within D, and extended out so as to connect the sides of the exterior fire-box or shell, A, and to form a free communication with the external atmosphere. Hollow stays, F, are inserted to connect D and E, and through these the external air received through E is allowed to

PIERCE & GRIFFITH'S STEAM BOILER.

Fig. 1



flow into the furnace. The annular space between D and E communicates with the water of the boiler, which circulates actively through, coming in from each side and ascending, mingled with steam, through the vertical pipes, D'.

The metal of all these parts, being always in contact with water, is kept sufficiently cool for their complete preservation. It might seem a disadvantage to introduce the streams of air at so moderate a temperature instead of allowing the particles to become intensely heated; but there is probably a gain rather than a loss therein in consequence of

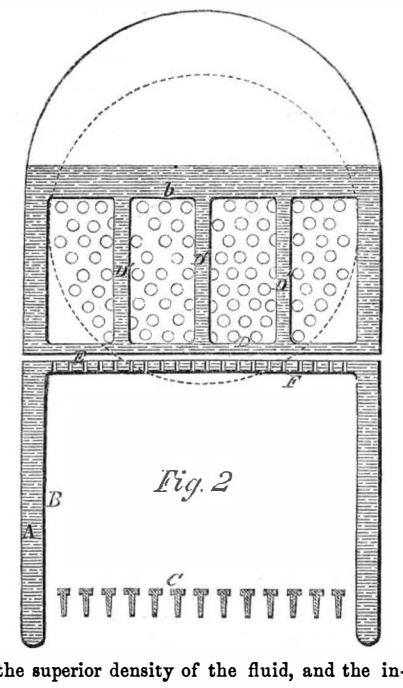


Fig. 2

the superior density of the fluid, and the invention in practice supplies the air in the very heart of the furnace and diffuses the streams uniformly throughout the whole area so as to fill the space with an intensely hot flame.

A crude and imperfect form of this invention has now been in use several months in a stationary boiler in Messrs. S. H. Ransom & Co.'s stove foundry at Albany, N. Y., and the result of its introduction has been very largely to reduce the daily consumption of fuel.

Letters patent for this invention were granted to Mr. Griffith Dec. 22, 1857, and to Mr. Pierce April 5, 1859.

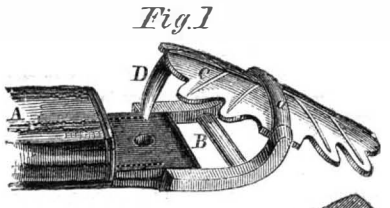
For further information address S. H. Ransom & Co., Albany, N. Y.

Smith's Trace Buckle.

This trace buckle, designed as it is with a view to ensure greater security and beauty than the common one, fills a space which has long been vacant for such an invention, and will, we have no doubt, meet with a general reception by harness-makers and others.

Fig. 1 shows the buckle, and Fig. 2 the same when fastening the trace.

Fig. 1



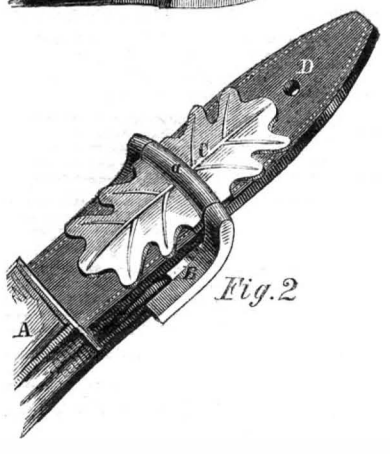


Fig. 2

A is a loop, on the end of which the buckle, B, is secured, carrying between its ends by a center, *a*, the plate, C, that has a projection or tongue, D, attached to the inner end. This tongue, D, passes through the strap, D (Fig. 2), when the trace is secured, and into a hole in the lower part of A, the plate, C, lying flat upon the top of the strap, and thus preventing any shaking out by the motion of the horse or vehicle, and causing it to become more secure as the strain increases; it can only be unfastened by bending D (Fig. 2) over the crossbar of B, seen in Fig. 1, as a fulcrum, and then pressing on the end of C to draw D, Fig. 1, out of the buckle-hole.

The inventor of this simple and secure device is O. B. Smith, of Monticello, N. Y., and he will be happy to furnish any further information upon being addressed as above. It was patented Dec. 21, 1858.

Trade-marks at Law.

Any person who devises a new name for an article and sells the article under that name, is protected by law in it as his property, which is called his trade-mark. A case of this kind was recently tried in the Superior Court of this city before Judge Pierrepont, wherein Messrs. Burnett & Co., dealers in perfumery, prayed for an injunction to restrain Phalon & Son from selling a hair-lotion under the name of *Cocoine*, which they asserted was essentially an imitation of their trade-mark "Cocoaine," which had acquired a high reputation and extensive sale.

The Judge decided in favor of the plaintiffs, and ordered an injunction to issue. The substance of his decision delivered on the occasion will be of great interest to our manufacturing readers.

The plaintiffs, Burnett & Co., contrived a new name (Cocoaine) unknown in any language, and adopted it as their trade-mark for a hair-lotion. It was advertised extensively in every important journal in this city; it attained a large sale and an established reputation, when the defendants commenced the sale of their mixture under the designation of "Phalon & Son's Cocoine." Was this contrivance calculated to mislead the bulk of unwary purchasers, and thus benefit the defendants while it injured the plaintiffs, and deceived the public? An honest answer must be in the affirmative. Every man has a right to the reward of his skill, energy and honest enterprise, and when he has appropriated as his trade-mark letters combined into a word unknown before, and has used that word and published it to the world as his adopted trade-mark, he has acquired rights which the Courts will protect. No one can appropriate a word in general use as his trade-mark so as to restrain others from using it; but the word "Cocoaine" is not a common word, and it was no hardship to restrain defendants from its use as a trade-mark. They can adopt another designation for their mixture, and there is no necessity for a close imitation of another's trade-mark. When a person adopts the similitude of another's trade-mark, he does it for the purpose of deriving advantage from the toil and invention of another to which he has no right. These legal opinions will serve as a restraining guide to those who are too ready to take advantage of the enterprise of others, to which they have no claim.

Revenue of the Patent Office.

The financial condition of the Patent Office was never in a more healthy state than at present. This is about the only department under government which is not dependent upon the income derived from our custom-houses for its support. But the Patent Office —thanks to the Inventors of our country—is not only a self-supporting institution, but is actually getting rich. We do not know what the exact receipts at the Patent Office are; but judging from the amount paid into the Treasury from *this* office, we presume the receipts must be over $4,000 per week. During the last week ending May 21, there was paid into the Treasury, to the credit of the Patent Fund, from the home office of the Scientific American alone, the sum of *eighteen hundred and thirty dollars*.

Steam navigation has begun with great activity on the New York & Erie Canal, this season, and the old horseboats are threatened with annihilation. The steamboats not only propel themselves but tug three or four others behind them at the same time. The steam-tug, *Beemis*, ran from Buffalo to Schenectady, last week, in five days and eight hours, towing three other boats nearly as large as itself.

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Scientific American.

NEW YORK, MAY 28, 1859.

American Steel.

On several occasions we have directed public attention to the manufacture of steel from American iron, and have urged our iron producers to engage in the business. From present indications we are led to believe that, in a few years hence, we shall be making most of the steel required for common purposes, instead of importing it, as now, from abroad. The Damascus Steel Company have erected large works at Port Richmond, Staten Island, for making steel by Neville's patent, and they are now in successful operation, making about four tons per day. With an improved furnace and special manner of treatment they take the iron ore and convert it, by one continued process, into puddled iron, when it is rolled into strips, and has but to be cut into pieces and heated with fine carbon, some manganese and a cyanide, in crucibles, when it comes out cast steel of a very uniform and excellent quality, suitable for many purposes for which English steel has hitherto been used. The improved processes introduced by this company enable them to enter our metal market with no common advantages.

Iron is perhaps the most sensitive of all metals. A small difference in the quantity of carbon combined with it makes all the differences of pig iron, wrought iron and steel. Ordinary pig iron contains an excess of carbon, while common wrought iron contains but a trace of it. Steel, on the other hand, contains an amount of carbon intermediate between wrought and pig iron. In England the practice of making steel hitherto, has been to convert the pig metal into wrought by decarbonizing it, then to carbonize it away with the proper quantity of charcoal by another melting process. The question might very naturally arise here, "Why not convert the pig iron into steel direct, in the puddling furnace, by taking away the exact amount of carbon it has in excess, thus saving the expense of reducing it to wrought iron and then carbonizing it into steel afterwards?" This is a fair and sensible question, and we have to answer that, within the past two years, this has been answered effectively in England, by the manufacture of what is called puddled steel. The object of steel-puddling is simply to decarbonize the cast-iron down to the limit of steel, and upon reaching that point to avoid further decarbonization, otherwise the product becomes wrought iron. As the agent for removing the excess of carbon in the iron is oxygen, a considerable supply of it is furnished in the process; but this has to be cut off and the heat maintained in the furnace for some time before the process is completed. A quantity of cinder, and sometimes an oxyd of manganese, is placed in the furnace to supply the oxygen; and so much success has attended the invention that puddled steel, which has twice the strength of wrought iron, is now furnished as cheaply, and is taking its place for making the plates of steam-boilers, the hulls of vessels, and the shafting of machinery.

We are informed that the manufacture of puddled steel has been successfully commenced by that enterprising company, Messrs. Corning & Winslow, of the Troy (N. Y.) Works, and that they produce a quality equal to the best in England. By a recent number of the London *Engineer*, we also learn that J. Spence, of Liverpool, England, has obtained a patent for manufacturing puddled steel by an improved furnace, without using any cinder or oxyd to assist in decarbonizing the pig metal. It is so constructed and arranged that a sufficient supply of oxygen is permitted to enter the furnace, so as to reduce the carbon of the metal to the exact point; then it is shut off and the heat maintained (so as to purify the metal) for some time afterwards, before the process is completed. This improvement is a step in the right direction, and deserves attention from those who are interested in this business. Such enterprizes and such improvements afford us pleasure to chronicle; they are cheering landmarks in the pathway of manufacturing progress.

Alexander Von Humboldt.

This great philosopher, traveler and author expired on the 6th instant in Berlin, Prussia, at the advanced age of ninety-one years. He had outlived three generations, his reputation as a man of science was world-wide, and he had been a witness of the most thrilling events that had ever transpired in the history of the world. He was born in 1769, seven years before the American Revolution, and had seen our country emerge from the condition of a few sparsely settled colonies to an independent empire, extending from the Atlantic to the Pacific Ocean, numbering thirty millions of inhabitants, and second to none in all that constitutes true greatness. He saw the old French Revolution rise in glory and go down in blood and gloom; he witnessed the rise of Napoleon the Great, and beheld his own land (Prussia) crushed beneath the despot's heel—a mere serf to France; he again saw the Corsican Conquerer chained a prisoner in St. Helena, and his whole kindred banished from Gaul; and now, just as his eyes were closing forever, the tramp of armed men fell upon his ear, going forth once more to battle under the banners of a Buonaparte and a Cæsar—the Gaul and the German—and who can tell what the end will be?

Alexander Von Humboldt received a high education in the University of Gottingen, where his taste for the sciences was cultivated with assiduity. His fame as a mineralogist was early established, and at twenty-three years of age, he was appointed to the important government post of Superintendent of Mines in Franconia. Having felt a strong desire to visit distant lands, he soon resigned this situation, and sold a large estate to furnish means for traveling in America. After man disappointments, he was at last enabled to visit the New World under the patronage of the Spanish government, and in 1799 commenced to explore the great valley of the Orinoco. During the five years he was a traveler on our continent, he visited the sources of the Amazon, climbed the snow-capped peaks of the Andes, and under a burning sun traversed vast plains, pestilential swamps, and barren deserts where the foot of white man had never trod before.

It affords us much pleasure to state that Baron Von Humboldt included a portion of our own country within his extended American tour. He visited our principal seaboard cities, and was personally known to some of our distinguished men. He quitted this country in 1804, and returned to his native land. Our institutions made a most favorable impression upon his mind, and he ever afterwards retained a pleasant recollection of our people. His published accounts of these travels, attracted the attention of the whole civilized world. The field was fresh, the power of the author's description was vivid; they were filled with thrilling incident, and contained a mass of new geographical, botanical, and mineralogical information of the most interesting character. His fame was at once established by their publication, and honors poured in upon him from the scientific associations of all lands. They were printed in seventeen large volumes, richly illustrated with figures of the subjects described. They embraced geography, zoology, botany, mineralogy, the natural history of animals, astronomy, geology, climatology, in short, every branch of science. So varied and profound were his attainments, it was at once felt that he stood out in bold relief as the most accomplished traveler that ever lived We would be neglectful, however, of a sacred duty, if we were to forget to state, in connection with this subject, that he had for an associate the celebrated French *savant*, Bonpland, who accompanied him in his journeys, and assisted in his literary labors.

Of late years, the name of Humboldt was made more widely known by his "Cosmos," a work written during the long and pleasant twilight of his life, in which he considers (and in this view he is right) all created things as linked together forming one uniform whole, and affording evidence of one great creative mind as the author of the visible creation. This work has been translated into several languages—our own among the number—and is replete with curious, varied and profound information.

Of this great man we can truly testify he was a benefactor to the human race, and his career is a noble example of a long life well spent in severe physical and mental toil, whereby the sphere of man's information has been greatly extended and enriched. His memory was prodigious, his intellect active and acute, and his taste exquisite; and over everything which he wrote he threw the charm of a genial disposition and a generous heart. For the past fifty years he has been the Nestor of Science, and has gone down to the grave bearing the esteem of all men, and "laden with wealth and honors nobly won."

Trial Trip of the Russian Frigate General Admiral.

On page 30 of the present volume of the SCIENTIFIC AMERICAN we gave an account of the successful launch of this splendid war frigate, built for the Russian government by our distinguished fellow-citizen, William H. Webb. We also presented an account of her dimensions, model, &c. Her capacity is about 6,000 tuns; length on spar deck 307 feet; breadth 55 feet; length over all about 325 feet, depth of spar deck 34 feet. She is pierced with 44 side ports and two stern ports on lower deck, and 30 side ports and four large ports forward, and four large ports aft on spar deck. Her armament will consist of 40 shell guns of large calibre on gun deck, and 20 long guns and two pivot guns of the largest size on her spar deck. The gun carriages are all of solid mahogany, although the contract was only for the ordinary white oak. The crew will number 800 men, and she has capacity to carry water and provisions for their sustenance sufficient for six months, in addition to which she has stowage room in her coal bunkers for 1,200 tuns of coal, and will draw not over 25 feet with everything on board for a six-month's cruise.

The engines and boilers of this vessel were manufactured at the Novelty Iron Works, in this city; and to all appearance, and so far as they have been tested, they seem to be in all respects worthy of the reputation of the builders. It must be confessed, however, that even in spite of the care of our marine engine builders, and the simplicity of the plans which have generally obtained among them, we have yet our reputation to establish in this department. We think, as a general thing, that British marine engines have proved more substantial and reliable than those made in this country. It is true that English and Scotch engineers have had more experience in this branch than our own; but we are rapidly fixing our reputation, and in respect to the case before us everything seems to be complete. There are two horizontal back-action engines, with 84-inch cylinders and 45 feet stroke; nominal horse power, 800, actual, 2,000. The propeller is Griffiths' Patent, illustrated on page 352 of Vol. XII of the SCIENTIFIC AMERICAN; the blade is made of brass and is 19 feet in diameter and 31 feet pitch. It is arranged on an adjustable frame, so that it can be readily lifted from the water. The propeller is driven by a line of shafting 124 feet long and seventeen inches in diameter at the journal. What is technically called the "thrust"—that is, the force of the screw against the ship—is kept off by a "collar thrust bearing" and a "parry roller bearing," arranged so that either can be used and readily unshipped. The engines proper weigh 150 tuns, the propeller 12 tuns, and brass fixtures 12 tuns. The engines are supplied with Silver's marine governor, the object of which is to prevent "racing" in a head sea, or the sudden and swift revolution of the shaft when the plunges of the ship raise the screw out of the water. This governor was illustrated on page 356 of Vol. XI of the SCIENTIFIC AMERICAN, and we are happy to know that its worth is beginning to be appreciated. There are six horizontal tubular boilers, provided with a telescopic smoke-pipe, which is arranged so as to be hoisted or lowered at pleasure, being readily taken out of the way of the sails or during action. It is 11 feet in diameter. There are 38 furnaces provided with Van Syckles' grate-bar (which has also been illustrated in this journal), and these furnaces have 21,000 square feet of fire surface and 700 square feet of grate surface. The fire-room floor is 70 feet long by 10 feet wide, and we were much pleased to notice thas it is well ventilated. Our sympathy has often been stirred for the fireman pent up in his suffocating and uncomfortable quarters.

A very important feature in connection with the construction of this ship is the admirable system of ventilation recommended by Dr. D. B. Reid, of Edinburgh. The ventilating apparatus consists essentially of two pipes, each about 300 feet long and two feet in diameter, which command the whole ship. These have communication with the sleeping berths, the cabins, the hold, and every place where ventilation is required. This is the largest ship on which Dr. Reid's plan has been applied, although it has been adopted on several British vessels. The currents of air are produced by the aid of a donkey engine having a boiler of its own; this engine also drives two steam pumps, which pump out bilge water, supply water to six main boilers, and can be made to perform efficient service in case of fire.

The trial trip of this splendid specimen of naval architecture took place on Wednesday, the 18th inst. In consequence of a dense fog she did not go out to sea, but spent the entire day in cruising about the Narrows and the Upper Bay. The vessel was easily turned in a small circle; the screw made 48 revolutions per minute; and it was stated that a speed of twelve-and-a-half knots per hour was attained. The company on board consisted of about 600 persons—gentlemen and ladies; and the whole affair passed off to the entire satisfaction of all; and it was the unanimous opinion that the *General Admiral* is the most complete and superb vessel of the kind ever built. Several Russian officers were on board, and were highly gratified with their ship.

Not the least interesting portion of the affair was the exhibition of silver-ware, porcelain, glass and crockery, which alone cost $13,300. There is one set of porcelain for the Grand Duke, with the Russian coat of arms; one set for the captain, and one for the officers.

Early in June she will leave this port for Cronstadt, stopping at Cherbourg, France. Mr. Webb and family, with the Russian officers, Captain Shestakoff, Schwartz, Frastchenko and Selirianoff, and Lieutenants Mojaisky, Belavenstz and Kolobuim, who have been superintending her building, will accompany her to her destination. The total cost of this vessel is about $1,000,000.

The Inventors' Exchange.

We are receiving inquiries from all parts of the country relative to "The Inventors' Exchange," an agency for the sale of patents, recently established, and having rooms in the same building occupied by the SCIENTIFIC AMERICAN. So far as we are acquainted with the gentlemen having the business in charge, and the system of their operations, we think the object a good one, and have no doubt the inventor who cannot attend to introducing his own invention may avail himself of the services of "The Inventors' Exchange" to advantage. By the perusal of an advertisement which appeared in our columns last week, those who have not already informed themselves in regard to the object of this exchange may be enlightened.

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The Art of Bird-Stuffing.

How often have our weary hours been solaced and our shadowy days made light by the singing of the birds and the observation of their graceful forms as they flew from bough to bough or hopped from twig to twig, and we, like other mortals, have wished to preserve around us the beauteous plumage and the perfect figure! We have recently discovered in an English exchange some simple instructions how to do this, and for the use of such of our readers who would like to stuff the birds they kill or that die in their houses, we reproduce the directions:—

Beginners should never attempt to stuff any bird smaller than a blackbird; the larger the bird the easier it is to stuff. First put a small quantity of cotton wool down the throat in order to prevent any moisture escaping from the stomach; this is highly important, and must never be omitted; then break the bones of the wings close to the body; divide the feathers from the bottom of the breast-bone to the vent; divide the skin in like manner. Great care must be taken not to puncture the abdomen; raise the skin with the point of a pen-knife until you can take hold of it with your finger and thumb,; hold the skin tight and press on the body with the knife as the skin parts from it, putting the knife farther under until you reach the thigh; break the thigh-bone close to the top joint, and push it gently up until you can take hold of the flesh; now take the bone that is attached to the leg and pull it gently out, turning the skin of the leg inside out; cut the flesh off close to the knee and skin as far down to the back as you can. Do the same with the other side of the bird; if any wet escapes from the flesh, dry it up with fresh bran. With a small pair of scissors, put the skin on both sides out of your way as much as possible; push the body up (the tail of the bird being held in your hand); cut through as close to the tail as possible (this is done inside the skin); then take the bird by the back-bone and gently push the skin down with your thumb-nail till you come to the wings; take as much flesh from the wing joints as you can, and go on skinning till you reach the ears; take hold of them close to the skull and pull them out. Take the eyes out, and be careful not to burst them, holding the skin with one thumb and finger while you pull the eye out of the skin with the other; after taking the eyes out, put as much cotton in the sockets as will fill them nicely. Skin down to the beak very gently, cut the neck away from the skull, and also a piece of the skull to take the brains out; anoint the skin with arsenicated soap, put a little tow round the thigh bones to form the thigh, and gently turn the skin back again; if care has been taken, the loss of the body will make but little difference in the size of the bird. Get three wires, one as long again as the bird, the other two twice the length of the legs, file them sharp at one end, bend the blunt end of the long wire, put some tow on the bend and squeeze it tight to fasten it, then twist the tow until it is about the size of the body, do it as tight as possible. Have some tow cut up small; get a strong wire, rough one point, and turn the other into a bow to held in your hand; take hold of some of the tow with the rough end, and push it up the neck; this requires but a small portion of tow; put some in the chest and a little all over the inside of the skin. Put the body wire up the neck, and bring it out through the skull at the top of the head; draw the body into the skin and be careful not to stretch the neck; then put the other wires through the center of the foot up the legs, being careful not to break the skin; put enough wire inside the skin to push into the body to fasten the legs; cut off a piece of the wire that has gone through the head, put it through the tail into the body (under the tail, of course); open the eyelids, and put in the eyes (patience is required in young beginners to do this); mount the bird on a perch fastened to a small board, bend the legs so that it will seem to stand in a proper position, be careful not to loosen the leg wires from the body, bring the feathers nicely together between the legs, bend the neck, and put the head in the shape you think proper, then run a pin or a piece of wire through the butt of the wing and into the body, to keep it in its proper place. Should the bird be out of shape in places, raise the skin gently with a needle, put the feathers as straight as you can, put a pin in the breast, back, and under each wing near to the top of the thigh, fasten the end of some cotton to one of the pins, and gently wind it round the bird from one pin to the other; put up the bird when you see that it is right. You had better let the specimen dry of itself, then bake it; keep it free from dust, and it will dry in a fortnight. Spread the tail in a natural position, and when it is dry, unwind the cotton; cut the pins close to the butt of the wing and the head; take out the others, and the bird is finished.

Manuring Apple Trees.

Messrs. Editors:—Please inform me what effect it would have on the growth of an old tree if the ground around it were covered for about one foot in depth with manure. How much higher would the tree grow during one summer?

L. R. B.

New York, May, 1859.

[The growth of any tree during one year—either with a liberal application of manure or without any—depends on the character of the seasons, on the nature of the tree itself, and also on its size, as each tree requires food in proportion to its mass. We take this opportunity, however, to make a few remarks regarding the manuring of our chief of fruit trees—the apple.

It would naturally be inferred that apple trees should prosper in growth and yield of fruit in proportion to the amount of fertilizing material applied to them. Such, however, is not the case. No trees are more easily injured by over-forcing, and none require more care and caution in the application of manure. In the northern States, where the winters are severe, and where apples attain to a very high state of perfection, if such trees are forced by manure they become enervated, and their fruit falls off before it becomes ripe, while at the same time they are liable to injury from excessive cold. We were personally acquainted with a series of experiments undertaken in central New York to test the effect of manure on apple trees, and the results of a liberal supply were such as we have stated, namely, much of the fruit fell off before it was ripe, and many of the branches were killed by the frost; while those trees which received no manure kept their fruit well and stood the winter without injury. It was also found that the Fall of the year was the best period for applying any manure that was required.

Mr. Watson, in his "American Home Garden," states that fruit trees, after they have come into bearing, should only be moderately manured. A little salt may be spread widely around them in the spring, or air-slaked lime, at the rate of ten to twenty bushels per acre. * * Liquid manure of any kind should be cautiously applied. Animal matter, such as horn-shavings, wool-waste, &c., is valuable; but care should be taken to apply it rather in deficiency than in excess, watching the effect upon the trees, and repeating or discontinuing its use accordingly, always aiming to induce moderate, regular and steady growth rather than excessive bearing. A very thin top-dressing of well-rotted barn-yard manure in the Fall, and about ten bushels of plaster to the acre, sown in the spring every three years, is held to be about the best known method of treating an apple orchard.

Traveling in Circles.—A recent correspondent of the *N. Y. Daily Times* advances the theory that the reason why lost persons travel in circles, when bewildered, is because one leg is shorter than the other. We trust that the author of this profound and brilliant idea will permit us to laugh at his theory, at least.

Enameling Hollow Ware.

An English journal gives the following advice about enameling of cast-iron sauce-pans and other hollow-ware:—

The vessel must be first cleaned by exposing it to the action of dilute sulphuric acid (sensibly sour to the taste) for three or four hours, then boiling the vessel in pure water for a short time, and next applying the composition. This consists of six parts calcined flints, three parts borax calcined and finely ground with the above. The mixture is to be fused and gradually cooled; then add one part potter's clay; the whole to be ground together in water until the mixture forms a pasty consistenced mass, which will leave or form a coat on the inner surface of the vessel above one-sixth of an inch think. When this coat is set, by placing the vessel in a warm room, the second composition is to be applied. This consists of six parts white glass (without lead), two parts borax, and two parts soda (crystals), all pulverized together and vitrified by fusion, then ground, cooled in water, and dried. To this mixture one part soda is to be added, the whole mixed together in hot water, and when dry, pounded; then sifted finely and evenly over the internal surface of the vessel, previously covered with the first coating or composition, whilst this is still moist. This is the glazing. The vessel thus prepared is to be put into a stove, and dried at a temperature of 212°. It is then heated in a kiln or muffle like that used for glazing china. The kiln being brought to its full heat, the vessel is placed first at its mouth to heat it gradually, and then put into the interior for fusion of the glaze. In practice, it has been found advantageous also to dust the glaze powder over the fuzed glaze, and apply a second fluxing heat in the oven. The enamel, by this double application, becomes much smoother and sounder. It must be further observed that, when the "general material" for enameling is made, the different colorings are easily imparted, as required; but specific receipts must be given for these details.

Cotton-bale Iron Hoops.

The New Orleans *Crescent* of the 2d inst. gives an account of a rather expensive experiment that was lately made on the Metaire race course, near that city, for testing the superiority of the iron hoops of H. Fassman on cotton-bales, in cases of fire, over the old hempen rope. Four bales of cotton were subjected to the test, to wit: one bale of ordinary packing, from a country press, bound in rope; a similar bale bound in iron; one small compressed bale bound in rope, and a similar bale bound in iron. All were placed on properly erected piles of pitch-pine sticks, filled in with chips and shavings, in order that the fire, when started, might be fierce and rapid. In about fifteen minutes after the fire was applied, nearly all the ropes of the two bales had parted, which thus permitted the cotton to burst out and burn. On the other hand, although the bagging of the iron-hooped bales was burned, the cotton remained firm, and all the effect produced upon the cotton was a slight charring of its outside surface. In half an hour the rope-bound bales had fallen down in loose masses, and the cotton burned freely, but the iron-bound sides sustained very little injury. This experiment afforded positive proof that iron-hooped cotton bales will prevent the rapid burning, by accidental fires, of cotton-laden steamers and cotton-filled stores. As long as cotton bales are kept firmly bound together the air cannot penetrate into them to support combustion; the fact, therefore, is self-evident, that iron hoops for cotton bales are the most safe, as a provision against fires.

The Cigar Steamer.—This vessel made another trip on the 10th inst., after being greatly altered, but as we learn from the Baltimore *Sun*, it could not have met the approbation of its owners, notwithstanding the flattering account given, as the article closes by stating that very great alterations are again to be made in her hull and machinery.

The New Series—What is said of the Proposed Change.

Venturing on a new enterprise, when its success depends more upon the taste or caprice of others than upon personal industry or capability, is at all times a hazardous affair. The enlargement and proposed alteration of the size of the Scientific American is such a venture, and our gratification is extreme when we find that our efforts are appreciated throughout the country, and our desire to spread information and intelligence meets with a warm and hearty reception all over the land. We are continually receiving letters approving of our scheme, and offering aid in extending our sphere of usefulness, a few of which we publish to stimulate others to follow the bright examples of the writers, our only wish being that all who read will "do likewise."

Mr. H. S. Hull, of Jamestown, N. Y., writing for the firm with which he is associated, says:—"We are in receipt of your note announcing the success of our application, and last evening's mail brought our Letters Patent from Washington. Please accept our sincere thanks for the promptness and ability with which you have conducted our case to a successful issue. We were agreeably surprised to find the case acted on so soon, supposing it would take a longer time. The 'Scientific' is already a—I won't say 'household'—but I will say 'shop word,' in this village, and through the exertions of a very worthy gentleman (Mr. Palmeter) who is agent here, many are being induced to subscribe to the new series, and *all* are very politely invited to hand in their names. I have been a reader of your journal for the last two years, and in due time shall register my name among your subscribers. As far as personal influence extends, I will pledge *that* in your behalf for the future."

[The Mr. Palmeter who is mentioned by Mr. Hull, has been a warm supporter and admirer of the Scientific American for many years.—Eds.]

L. Hatfield, for 28 subscribers, of Cuyahoga Falls, Ohio, says:—"I have talked with some readers of the Scientific American in regard to your scheme of enlargement and change of time of commencing, and system of dividing the volume. All approve of the plan. I think we can send you a respectable list of names to commence the volume with. You have our thanks for the correct and plain answers you have given to the many questions we have troubled you with."

[No trouble, friend Hatfield; it is part of our business.—Eds.]

John Shinn, of Loverington, Pa., agrees with our idea fully. He writes:—"'Being a constant reader of your valuable paper, and seeing in your last number a notice of your proposed enlargement and improvement, I think that I could get up a club of twenty, at least, in the immediate neighborhood where I live. Your paper is a valuable one, and should be in the hands of all mechanics, manufacturers and dyers. The volumes which I possess I find extremely useful for reference."

P. H. Wait, of Sandy Hill, N. Y., writes, saying:—"With much pleasure I read the announcement of your project of folding the Scientific American into a smaller form, as well as extending the reading matter. * * * In suitable binding it would grace any center table or reading room."

With encouragement like this we feel hopeful for the future, and trust that our present readers will do what they can to prevent us being out of pocket from our extended outlay. They can do this easily if every one would only send another subscriber; the reward is worth the labor, and we have faith to believe that all will try.

Foul Wells.—A correspondent of the London *Times*, referring to a recent case of choke-damp in a well, says:—"If an empty bucket had been lowered, drawn up, and inverted away from the mouth of the well, so as to empty it of its heavy carbonic acid gas, and this repeated again and again the pit would speedily have been freed of its noxious damp."

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Notes and Queries

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts must always observe the strict rule viz. to furnish their names, otherwise we cannot place confidence in their communications.

C. P., of N. Y.—Four arms are sufficient on a windwheel of twelve feet diameter. We would not run it faster than six revolutions per minute. Its power, according to the amount of sail surface spread and velocity of the wind, will range from two to six horses.

C. T. R, of Ill.—Lead makes a good steam joint, and will answer your purpose well, we think. Air can be heated to the temperature of steam by passing it through a pipe in a furnace, almost as fast as you can force it in with a pump.

P. H. W., of N. Y.—From your meager description of the locality, we cannot tell how the water gets to the top of the hill.

S. G., of N. Y.—We thank you for the fine list of subscribers you have already engaged for the new series, and are gratified by the flattering encouragement we are receiving from all parts of the country, as well as from yourself. We will send you a prospectus. We never engage in the sale of patents, but think your invention one in which you will have but little difficulty in selling, when brought before the public.

R. G. P., of N. J.—There are hydraulic engines now in operation at Newcastle, England, which are nearly similar in form and action to steam-engines. So far as we know, none are in use in our country.

J. H. B., of Pa.—The respective size of cone pulleys of different diameters cannot be determined by a common rule, as it depends, in a great measure, upon the distance of the centers or axles of these pulleys; and even for a particular case, it would be difficult to state the rule for calculating the size of the corresponding pulleys in words. If you give us the distance of the shaft of your two pulleys, and the size of the driving pulley, together with the diameter of the largest or smallest part of the driven pulley, we will be able to give you the size of the rest.

W. L., of Pa.—There is no published work upon woolen manufacturing, coloring, and cloth-dressing.

W. T., of N. Y.—A tablespoonful of citric acid will make a tumbler-ful of lemonade to suit our taste, but this may not suit yours. You must add the acid, and stir in the sweet until your own palate is tickled to a nicety.

O. L. C., of Cal.—It is somewhat difficult to mend worn vulcanized india-rubber goods. A varnish made of india-rubber dissolved in naphtha or turpentine is the most suitable for this purpose; it must be applied warm.

C. D., of Ohio.—If A gets a patent for a machine, and C makes an improvement on it, C can prevent A from using his improvement and *vice versa*. C is entitled to a patent for any improvement he may make on any existing patent.

J. M. K of Conn.—We do not know of any such article in can market as "cast-iron coppered kettles."

J. L. & Co., of Mass.—We do not know any method whereby you can make the wooden pegs very hard, and retain their color, except by submitting the wood to very severe pressure when in blocks.

J. S. N., of N. J.—The paint of a school black-board will endure much longer if covered with a coat of copal varnish containing a minute quantity of very fine emery; allow it to become perfectly dry before it is used.

E. C., of Ohio.—It is not easy to remove the disagreeable taste from water which has been impregnated with coal smoke. To do so you should employ quite a large filtering box for the entrance of the water to the retaining cistern or reservoir. Make a strong wooden box, three feet by four wide, and eighteen inches deep, with a tube leading from its bottom to the cistern. Nail a coarse canvass cloth on its bottom, and place a layer of clean gravel on the top of this three inches thick, then another layer of clean sand, mixed with gravel, six inches thick; and above this, three inches of nut size charcoal, then of gravel and sand six inches. Over this secure a piece of cotton or woolen flannel for the water to fall upon, and let it be washed frequently, as its pores will soon fill up. This filtering box should be situated in a convenient position, to allow of its contents being renewed frequently, as this is the only way to render it practically effective in purifying the water.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, May 21, 1859:—

D. B. R., of Ala., $275; J. A. P., of Mich., $30; D. S. H., of Ill., $10; J. S., of Ct., $25; J. O. K., of Miss., $25; A. D. B., of Ga., $56; J. T., of Ill., $25; W. S. & Co., of Ky., of $60; E. McK., O., $30; D. S., of Ill., $25; S. E. G., of Ill., $25; D. N., of Ill., $20. E. A. T., of N. Y., $30; S. & W., of Texas, $15; C. A. D., of La., $100; D. W. S., of N. Y., $20; F. V., of La., $50; E. S., of La., $70; S. F. J. of Ind., $25; E. B., of Pa., $30; J. W., of Mass., $30; J. B. A., of N. Y., $250; G. S. T., of Mich., $25; L. D., of Ct., $40; J. B., of N. J., $25; J. A., of N. Y., $15; J. P., of Ill., $25; E. M., of N. Y., $50; N. W., of Mass., $40; D. V., of N. Y., $25; H. B., of N. Y., $15; J. A. A., of N. Y., $30; R. R., of Vt., $25; W. R., of N. H., $30; H. E., of N. Y., $55, M. A. H., of R. I., $55; H. G., of La., $110; A. T. U., of $57; H. T. M., of Ill., $25; H. & G. of Pa., $100; J. N., of Wis., $25; T. M., of N. Y., $30; J. C. P., of La., $30; B. B., of N. Y., $50; J. C. S., of Wis., $47; H. W. S., of Wis. $30; G. T., of N. Y., $25.

Specifications drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 21, 1859:—

B. T. C. of Me.; J. W. of Mass.; R. R. of Vt.; G. S. T., of Mich.; J. B. of N. J.; C. G. E. T. of France (2 cases); C. & J. K. G. of Pa.; D. N. of Ill.; D. W. S. of N. J.; B. B. of N. Y.; E. S. of La.; S. F. J., of Ind.; H. T, M. of Ill.; G. T. of N. Y.; J. S. of Ct.; L. H. C., of N. Y.; J. O. K, of Miss., J. T. of Ill.; J. N. of Wis.; H. E. of N. Y.; H. M. of France; M. A. H. of R. I.; J. A. A, of N. Y.; H. B. of N. Y.; F. V. of Texas (2 cases); H. & G. of Pa.; L. D. of Ct.; D. S. of Ill.; S. & W. of Texas; J. P. of Ill.; N. W. of Wis.; A. S. of N. Y.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office. 37 Park Row. New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

MESSRS. MUNN & Co.—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant.

J. HOLT.

Communications and remittances should be addressed to MUNN & COMPANY, No. 37 Park-row, New York.

FOUNDRY AND MACHINE SHOP FOR SALE AT AUCTION.—I will sell to the highest bidder, on the 15th of June, 1859, commencing at 10 o'clock, the Ground and Brick Buildings, consisting of Foundry, Machine Shop, Blacksmith Shop, Brass Foundry and Pattern Shop, situated on the south side of Monroe st., between Eleventh and Twelfth streets, Louisville, Ky. The foundry has 3,500 feet molding floor; blacksmith shop has six forges and a fine lot of tools; finishing shop has about 12,000 square feet of room, with boiler and two engines to drive machinery, one for fan.

1 large Horizontal Boring Mill, for cylinders.
2 Upright Boring Mills, turn 6½ and 8 feet.
1 Double-Headed Lathe, 36 feet bed; swings 40 inches.
1 " " 21 " " 33 "
7 Small Lathes; turn from 3 to 12 feet.
1 Planer 12 feet by 3 feet square.
1 Compound Planer, with circular attachment.
3 Wood-Turning Lathes.
3 Drill Presses, 1 Gear Cutter, 1 Bolt Cutter, Vises, and a fine assortment of small tools to expedite work.

Terms of sale will be for the buildings and ground (which will be sold without any of the machinery), $7000 in one, two, three, four and five years, and the excess upon six and eighteen months, with lien and approved security upon the first four payments. The machinery and tools will be sold in detail: all sums of $50 and under, cash; from $50 to $500, six months; $500 to $1000, six and twelve months; and over $1000, six, twelve and eighteen months, with approved security payable in bank. All deferred payment to bear interest from date. E. A. GARDNER,

Assignee of Lawson & Pearce.

N. B.—The above buildings are admirably suited for an Agricultural Implement Manufactory, Planing Mill, Furniture or Tobacco Factory, Brewery, and for many other branches of manufactures. 38 2*

TO INVENTORS AND PATENTEES.—A. B. ELY, Counsellor-at-Law, Traveler Building, Boston, Mass., will give his personal attention and experience of fifteen years to consultations and trials in all matters relating to the law of patents, interferences, infringements, &c. 38 13*

MARINE RAILWAYS.—THE SUBSCRIBER, Marine and Naval Architect, is prepared to build Marine Railways and Dry Docks, and to furnish Steam and Horse-power Engines, Chains, Castings, &c., on short notice and on reasonable terms. Satisfactory reference given. Address H. I. CRANDALL, New Bedford, Mass. 38 13*

RIVETS.—EVERY DESCRIPTION OF RIVETS: Boiler, Tank, Safe, Belt, Hose, Shoe, and Tinman's, black and tinned, constantly on hand. Socket bolts of any size furnished on short notice.
38 13* TABER & GRINNELL, New Bedford, Mass.

A FIRST-CLASS PATTERN-MAKER OF long experience in the business, and having a knowledge of practical drawing, is desirous to obtain good and permanent employment, either to work at the bench or take charge of a shop; is competent, if necessary, to assist in drawing. For references, address J. H., Providence, R. I. 38 3*

SUN DIALS.—MANUFACTURED BY W. W. WILSON, Pittsburgh, Pa., of new and highly improved patterns of every latitude; a suitable cast column is furnished with them. Every garden, lawn and plantation should have one, being ornamental, accurate and useful. Address the maker for circular of prices, description, &c. 38 3*

A SUBSTITUTE FOR LEAD PIPE.—A New and Valuable Article, viz., a Semi-Elastic Pipe or Hose which can be used with pumps of any kind, for suction, forcing, or conducting water in any and every place where pipe is required. Its properties are:—It imparts no deleterious effects to the water, nor in any way effects it unpleasantly after a few days' use; it is sufficiently elastic to be bent into curves, and it is unaffected by heat or cold: it will not burst if water is frozen into it; it is not injured by exposure to the sun or atmosphere; it is composed of ingredients indestructible, except by fire. Samples of it have been tested by use for three years, without the least apparent decay, and it can be made to bear pressure as high as 400 lbs. to the square inch. Price not far from that of lead pipe. Circulars with prices and particulars furnished by the manufacturers. BOSTON BELTING COMPANY, corner of Summer and Chauncey streets, Boston, Mass. 31 13*

SPLENDID PHOTOGRAPHS OF THE celebrated Corliss Steam Engine have just been taken, and will be mailed to any part of the country on the receipt of 75 cents in postage stamps, by addressing WM. A. HARRIS, care of Corliss Steam Engine Co., Providence, R. I. 37 3*

THE SCIENTIFIC AMERICAN SIGNS, for Munn & Co., were painted by Ackerman & Miller. Refer to the Commercial Agency, McKillop & Wood, Park Buildings. All communications for signs, banners, or other ornamental work, attended to with dispatch. ACKERMAN & MILLER, 101 Nassau st., next to the New York Herald Office. 27 3m*

WHITMAN'S TURBINE WIND WHEEL.—Territorial or shop rights for sale. For particulars, inquire of the inventor, E. WHITMAN, at South Abington, Mass. 32 12*

WARTH'S SELF-ACTING WOOD-TURNING LATHES.—The best and most practical now in use; one boy will accomplish the work of four men. State and County rights for sale. Address A. WARTH, care W. H. Bertling, 23 Chambers st., New York, or the manufacturers, who have machines of all sizes on hand. Also a general assortment of machinists' tools. Circulars sent. Address CARPENTER & PLASS, 479 First ave., New York. 37 3*

CROZIER'S PATENT BARREL MACHINERY—Five hundred barrels can be made in a day by one set of machines. For machines or rights for State or county, apply to PETER WELCH, Oswego, N.Y., or to the agents, SLIPPER & GOADBY, No. 2 Broadway, New York. 37 4*

WELLS' PATENT IMPROVED CIRCULAR Saw Mills, acknowledged the best in use. Also, Portable and Stationary Steam-Engines of superior excellence; Water Wheels, Mill Gearing, &c. Address H. WELLS & CO., at their old stand, Florence, Hampshire county, Mass. 35 6*

HARRISON'S 20 AND 30 INCH GRAIN Mills constantly on hand. Address New Haven Manufacturing Co., New Haven, Conn. 27 13

CROSSETT'S PATENT STAVE CUTTER—Patented July 1, 1844: re-issued March 2, 1858; renewed and extended June 26, 1858.—The above mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap, and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill.
38 6c GEO. I. CROSSETT, Assignee.

WROUGHT IRON PIPE FROM ⅛ OF AN inch to six inches bore; Galvanized Iron Pipe (a substitute for lead), Steam Whistles, Stop Valves and Cocks, and a great variety of fittings and fixtures for steam, gas, and water, sold at wholesale and retail. Store and Manufactory 76 John, and 29, 31 and 33 Platt st., New York. JAMES O. MORSE & CO.
31 13

GUILD & GARRISON'S STEAM PUMPS for all kinds of independent steam pumping, for sale at 55 and 57 First street, Williamsburgh, L. I., and 301 Pearl street, New York.
32 6m GUILD, GARRISON & CO.

WOODWORTH PLANERS—IRON FRAMES to plane 18 to 24 inches wide—at $90 to $110. For sale by S. C. HILLS, 12 Platt street New York. 27 tf

WARREN'S TURBINE WATER WHEEL—Improved and patented by A. Warren and E. Damon, Jr. The vast number of these wheels now in operation, and the invarible success attending them, is the best evidence of their advantages over ordinary wheels in the economy of water power. The American Water Wheel Co. will send to applicants (enclosing two stamps) their pamphlet, containing engravings of turbines and a treatise on hydraulics. Address, A. WARREN, Agent, No. 31 Exchange st., Boston Mass.
32 9t*

INGOT COPPER, SPELTER, BANCA TIN, Lead, Antimony, Babbitt Metal, Mount Hope Cut Nails, Ames' Shovels and Spades, for sale by JOHN W. QUINCY & CO., No. 98 William st., New York.
13 12e5w*

EIGHT-HORSE PORTABLE STEAM ENGINE, cylinder 7½ by 15, governor, balance-wheel, &c., attached to a flue boiler, all new. Price $600. S. C. HILLS, 12 Platt-st., New York. e3w

BOLTS, RIVETS, NUTS, WASHERS, Square Head Wood Screws, and Chain Links, manufactured from superior quality of iron, suitable for machinists, millwrights, car-builders, miners, agricultural implements, &c. HOOPES & TOWNSEND, Buttonwood st., near Broad, Philadelphia. 32 6eow*

STEPHENS' DYES FOR WOOD—FOR dyeing inferior woods to imitate the valuable kinds. Samples and prospectuses sent everywhere on receipt of 15 cents in postage stamps. Stephens' Liquid Drawing Ink for Engineers, Artists and Designers, 12 cents per bottle. Sold by stationers and artists' colormen. HENRY STEPHENS, Chemist,
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THE SALEM WIND TURBINES ARE CONstructed of 45 and 65 feet in diameter, having areas of 1,500 and 3,000 square feet, and developing powers of 25 and 100 horses, under perfect regulation. Will stand up to a violent gale unreefed, with scarcely a vibration. A 40-feet turbine attached to a flouring-mill has been in successful operation on the praries for nearly three years, and one 45 feet in diameter is now in full work at Salem. Can grind from 40,000 to 50,000 bushels of corn annually. Turbines from one to six horses' power are also constructed upon the same principle. A card, with illustration, sent on application by mail to the Treasurer of the Turbine Manufacturing Company, Salem, Mass. 35 4teow*

STEAM WHISTLES—ALL SIZES OF THE most improved patterns constantly on hand. Brass Lift and Force Pumps, (single and double-acting) Ship Pumps, &c., a full assortment. Manufactured by HAYDEN, SANDERS & CO.,
16 13 eow* 306 Pearl st., New York.

CORLISS' PATENT STEAM ENGINES—On application, pamphlets will be sent by mail containing statements from responsible manufacturing companies where these engines have been furnished, for the saving of fuel, in periods varying from 2½ to 5 years. (The "James' Steam Mills," Newburyport, Mass., paid $19,734 22, as the amount saved in fuel during five years. The cash price for the new engine and boilers was but $10,500.) These engines give a perfectly uniform motion under all possible variations of resistance. Two hundred and fifty, varying from about 20 to 500-horse power, are now in operation. Boilers, shafting, and gearing.
CORLISS STEAM ENGINE CO.,
15 26* Providence, R. I.

BOILER FLUES FROM 1 ¼ INCH TO SEVEN inches outside diameter, cut to any length desired, promptly furnished by JAMES O. MORSE & CO., 76 John st., New York. 31 13

PATENT COMPOSITION BELTS—PATENT PACKING—The Company have on hand and are ready to supply all orders for their superior Composition Machine Belting. They are proof against cold, heat, oil, water, gases, or friction, and are superior to leather in durability, and much cheaper in cost. The composition gives to these belts uniform durability and great strength, causing them to hug the pulley so perfectly that they do more work than any other belts of the same inches. The severest tests and constant use in all sorts of places during the last 14 months has proved their superiority, and enables the Company to fully guarantee every belt purchased from them. Manufacturers and mechanics are invited to call, examine, and test these belts. The Patent Packing for planed joints is in every way superior to any other article ever used for that purpose. A liberal discount allowed to the trade. "New York and Northampton Belting and Hose Co.," E. A. STERN, Treasurer, 217 Fulton st., New York. 30 13

OIL! OIL! OIL!—FOR RAILROADS, STEAMERS, and for machinery and burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer, F. S. PEASE, 61 Main st., Buffalo, N. Y.
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STEAM ENGINES, STEAM BOILERS, Steam Pumps, Saw and Grist Mills, Marble Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and Pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front street, Brooklyn, N. Y. 27 tf

MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse, NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer. Nos. 37 and 38 Park Row, New York. 27 13

THE ENTIRE OR ANY PORTION OF THE right to Gardiner's Combined Chair and Lounge for sale. Illustrated in No. 37 of the present volume of the SCIENTIFIC AMERICAN. Apply to F. J. GARDNER, Washington, N. C. 37 8*

THE AUBIN VILLAGE GAS-WORKS WERE erected last year by one city and hundred village companies to their entire satisfaction. Towns having only fifty consumers of gas can rely on the stock paying dividends; and if one hundred, 10 per cent will be guaranteed. For references, apply to the Company, No. 44 State street, Albany, N. Y. 28tb

CARY'S CELEBRATED DIRECT ACTING Self-Adjusting Rotary Force Pump, unequaled in the world for the purpose of raising and forcing water, or any other fluid. Manufactured and sold by CARY & BRAINARD, Brockport, N. Y.
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IRON PLANERS AND ENGINE LATHES of all sizes, also Hand Lathes, Drills, Bolt Cutters, Gear Cutters, Chucks, &c., on hand and finishing. These tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address "New Haven Manufacturing Co., New Haven, Conn." 27 13

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HYDRAULIC JACKS OF 15, 20, AND 25 Tuns power—Prices, $100, $115 and $130 each. Hydraulic Presses of 15 tuns power, price $150. For sale by JAMES O. MORSE & CO., 76 John and 29, 31 and 33 Platt sts., New York. 25 3mos*

A MESSIEURS LES INVENTEURS—A vis Important.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez neus un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.
MUNN & CO. Scientific American Office, 37 Park Row, New York.

Zur Beachtung für Erfinder.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an
Munn & Co.,
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Auf der Office wird deutsch gesprochen.

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Science and Art.

Ice Cream Freezer.

There is one advantage of our climate which we do not usually estimate sufficiently highly, and that is, if our summers are hot and tropical, and if people do meet one another in the street with all the agony and used-up-edness of 95° depicted in their countenances, our winters are cold enough to give us a good supply of ice all the year round, and ice cream is the solace of the summer evening.

The freezers invented by H. B. Masser, of Sunbury, Pa., and patented by him Dec. 15, 1848, and Jan. 19, 1858, are so well-known as to scarcely need any description, were it not that at this season of the year we wish to say something on freezing, and to give some recipes for making ices of different kinds. Our illustration is a perspective view, with part of the outer tub, A, removed to show the interior. The cylinder, C, is capable of revolving in one direction by the handle, F, that is attached to the agitator, E, which is provided with a series of blades, *c*, and a wooden scraper, *e*, that is kept pressed close against the inside of the cylinder by the springs, *d*. On the bottom of the cylinder is a little stop which catches against the bottom blade, *c*, so that it carries the cylinder with it when rotated in one direction, and on the top, C, and its lid, D, is another stop, *b*, that prevents the cylinder revolving (being held by the hinged latch, *a*, attached to the cover, B), so that the agitator, E, revolves inside the cylinder. The ice should be made very fine, as it packs more closely around C, every part of which should be in contact with the ice. Fine ice, too, is more thoroughly mixed with the salt, causing the ice to melt more rapidly, thus disengaging the latent heat, by which means intense cold is produced, and the inner surface of C is instantly coated with a thin layer of frozen cream, which, by being removed as rapidly as formed by *e*, and thrown into the center, constantly presents a clean surface for renewal until the whole mass is frozen in its finest state of crystallization. As a simple illustration of the necessity of a revolving cylinder and scraper, it may be mentioned that stirring and agitating cold brine or salt water with the hand, can scarcely be endured, the cold being so intense ; while, if the hand is kept quiet, it can be held in the same with impunity. Again, the fine sheet of frozen cream should be re-removed from the sides of the cylinder as rapidly as it is formed, and this must be done by a yielding spring blade, without which it is impossible to construct a cylinder out of any sheet metal true enough for that purpose. A yielding spring blade, which will accommodate itself to the irregularities and inequalities of such a cylinder, is absolutely necessary to overcome this difficulty, and thus remove the frozen cream from the sides of the cylinder while no thicker than tissue paper.

These freezers are now made with iron bottoms and covers, stamped into shape by means of machinery made expressly for that purpose, and then tinned, by E. Ketcham & Co., No. 289 Pearl street, New York, sole agents for the United States.

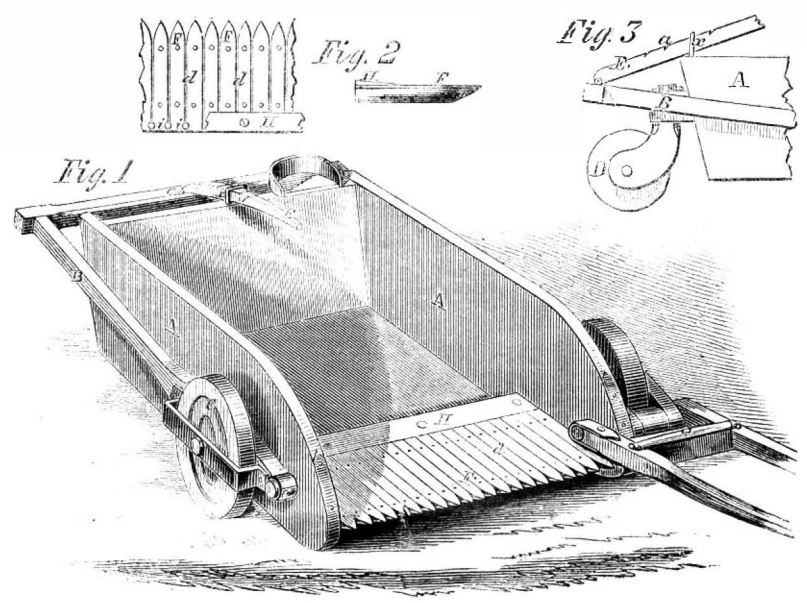
RECIPES.—The following recipes are furnished us by Mr. Masser, (who has probably investigated this subject more scientifically and with more success than any other person in the country), and will be found valuable to all housekeepers who wish to make their own ices :—

When pure cream cannot readily be obtained, ice cream is frequently made from milk, with the addition of other ingredients, to enrich it and give it consistency. For this purpose eggs, arrow-root, and similar substances are used. As a general rule, meagre or thin cream or milk requires more sugar. The following recipe, as a substitute for pure cream, has been successfully used :—Two quarts good rich milk, four fresh eggs, three-quarters of a pound of white sugar, six teaspoons of Bermuda arrow-root. Rub the arrow-root smooth in a little cold milk, beat the eggs and sugar together, bring the milk to the boiling point, then stir in the arrow-root, remove it then from the fire and immediately add the eggs and sugar, stirring briskly to keep the eggs from cooking, then set aside to cool. If flavored with extracts, let it be done just before putting it in the freezer. If the vanilla bean is used, it should be boiled in a little milk or water. Vanilla can be made to go as far again as usual by boiling the bean a long time in a close vessel.

For orange or pine-apple cream, cut the fruit in thin slices and cover the same with plenty of fine or pulverized white sugar. After standing a few hours, the sirup can be drawn off and used for flavoring the cream as above described. The flavor of other fruits can be extracted and used in a similar way.

For orange or lemon water ices, grate on the head of loaf sugar the outer rind of two or three good oranges or lemons, and to each quart of water add the above, with the juice, and a pound of white sugar to sweeten the same. The white of one or two eggs should be added to every quart to give it consistency. To make Roman punch, it is only necessary to add to the lemon mixture a little rum or Jamaica spirit.

MILLS' CLOVER-PICKER.



The clover plant as everyone is aware bears its seed in a beautiful head, which rises with graee and natural elegance from among the three-leaved clusters that form the plant. It grows among the grass as we have represented in the accompanying illustration, in order to remind our readers of its form so that they may the better appreciate the machine for picking the clover-head for the preservation of the seed or other purposes. We may state that this is the first machine for the purpose which we remember to have seen, and its beautiful simplicity is much to be admired.

Fig. 1 is a perspective view of the whole machine, A being a box or cart provided at the front with a series of angular teeth, F, with spaces, *d*, between them and larger round spaces, *i*, at their backs through which the stalks pass after the heads have been cut off by the knife, H, that is placed over them. This is better seen in Fig. 2. A is supported by a caster wheel, D, at the back, Fig. 3, and by two wheels, C, in front, so arranged that the pickers can be raised or lowered to suit the varying hight of the clover. The wheels, C, are carried by a framing, B, that is secured to A by pivots, *c*, and at its back a lever, E, provided with notches, *a*, is pivoted to B, at *e*; these notches catch in a loop, *x*, on the back of A and so hold the front end or picking device at any desired hight from the ground. This machine can be readily worked by anyone without requiring any adjustment, and it is so cheap that no farmer need be without one. One man with a single horse can, it is stated, gather from six to ten acres per day, and not injure the grass or herbage, and the driver has the raising and lowering at his command without stopping the machine. It was patented Feb. 1, 1859, and the inventor is W. T. Mills, of Galesburgh, Mich., who will be happy to furnish any desired information concerning it, that we have not given.

New British Patent Office.

The United States Patent Office is one of the most beautiful structures in the City of Washington and is a credit to our country. In this feature, as connected with the issuing of patents, we are in advance of all other governments, and have set them an example which Old England is about to follow. A sum of about $150,000 of surplus patent funds is recommended to be appropriated for this purpose the present year, and that the building should contain a museum for models and all the other departments which we have in the Office at Washington. It is high time that such a building was erected in London, and we are surprised that Uncle John, with all his practical sagacity, should have grown so old before his pride permitted him to follow in the footsteps of his illustrious descendant, Jonathan.

ENLARGEMENT
OF THE
"SCIENTIFIC AMERICAN."

Volume I., Number 1—New Series.

The Publishers of the SCIENTIFIC AMERICAN respectfully announce to their readers and the public generally, that, on the first day of July *next* (1859), their journal will be enlarged and otherwise greatly improved; and at that time will be commenced "Volume I., No. 1, New Series," which will afford a more suitable opportunity for the commencement of new subscriptions than is likely to occur again for many years.

The form of the journal will be somewhat changed from what it now is, so as to render it better adapted for binding and preservation and instead of eight pages in each number as now, there will be *sixteen*, and in a completed yearly volume the number of pages will be doubled to 832, or 416 more than now. By this change, also, there will be a large increase in the quantity of the reading matter : and it is the confident expectation of the publishers that they will be able to make it the most useful and instructive journal now issued from the American press.

The SCIENTIFIC AMERICAN is no new enterprise. Its character and influence have been acknowledged and felt for nearly fourteen years past. It is the only journal of the kind in the United States which has met with success; and since its commencement, no less than fifteen similar journals have been started, and have expired after a brief and unhealthy career. The SCIENTIFIC AMERICAN is published at a price which places it within the reach of all; and as a work of reference for the Workshop, Manufactory, Farm, and Household, no other journal exceeds or even equals it in the value and utility of its information. Its practical recipes alone oft-times repay the subscription price ten-fold. The Inventor will find it, as heretofore, the mirror of the Patent Office, and the reliable record of every claim issued weekly by the Office, the list being officially reported for its columns. The Machinist, the Manufacturer, the Farmer, the Planter, the Engineer, the Architect, the Millwright, the Chemist—in fact, all who take the slightest interest in the development and progress of art, science and industry, will find its pages useful and instructive. With the enlargement of the SCIENTIFIC AMERICAN, we shall be enabled to widen the sphere of our operations, and it is our intention to devote space to a Price Current, and a column or two to the Metal and Lumber markets, and such other branches of trade as may be interesting, and these will be given as often as we may think it useful to our readers.

The value of the SCIENTIFIC AMERICAN as a work of reference is shown by the large number of volumes yearly bound by subscribers; and there is now a constant demand for all the back volumes which it is impossible for us to supply. Large sums have been offered for the complete work.

The increased outlay to carry out our design of enlargement will amount to eight thousand dollars a year on our present edition; and in view of this we appeal to our readers and friends to take hold and aid in extending our circulation. Think of getting, at our most liberal club rates, a yearly volume containing about 600 original engravings and 832 pages of useful reading matter, for less than three cents a week! Who can afford to be without it at even ten times this sum?

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